2002 STANDARD DRAWINGS

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September 18, 2003

Memorandum UTAH DEPARTMENT OF TRANSPORTATION

DATE: September 18, 2003

TO: Region Directors
Project Engineers
Project Design Engineers
Project Managers
Consultants and Contractors

FROM: Barry Axelrod, CDT
Standards and Specifications

SUBJECT: Standard Drawing [U.S. Standard Unit (Inch-Pound Units)] Change 5 Dated September 18, 2003

A new index and updated drawings are attached. Please take the following action with respect to the attached pages.

REMOVE	**INSERT**
Cover	Cover - revised for Change Five
N/A	Memo - Insert after cover
Index	Index - revised
N/A	Listing of Revised Standard Drawings, Change Five
Sheet 1B	Sheet 1B - revised
Sheet 1C	Sheet 1C - revised
N/A	DD 2 - new
N/A	DD 4 - new
N/A	DD 5 - new
N/A	DD 6 - new
N/A	DD 7 - new
N/A	DD 14 - new
GW 9	GW 9 - revised
GW 10	GW 10 - revised
N/A	GW 11 - new
ST 2	ST 2 - revised
N/A	ST 9 - new

Electronic files for all Standards Drawings are available from the Standards and Specifications Web page on the Internet. The files are in Adobe pdf format.

If you have any questions or problems with the electronic files contact me at 801-964-4570 or by email at baxelrod@utah.gov.

STANDARD DRAWINGS INDEX (Change Five, Dated 09/18/03)
UTAH DEPARTMENT OF TRANSPORTATION

U	NUMBER	TITLE	CURRENT DATE
		Advanced Traffic Management System (AT)	
	AT 1	Legend Sheet	07/03/02
	AT 2	Ramp Meter Details	07/03/02
	AT 3	Ramp Meter Sign Panel	07/03/02
	AT 4	Typical Ramp Meter Signal Head Mounting	07/03/02
	AT 5	Loop Installation	07/03/02
	AT 6	Conduit Details	07/03/02
	AT 7	Polymer-Concrete Junction Box Details	04/24/03
	AT 8	ATMS Cabinet w/120V Disconnect	07/03/02
	AT 9	ATMS Cab With Stepdown Transformer	07/03/02
	AT 10	Domed CCTV Details	07/03/02
	AT 11	CCTV Pole Detail	07/03/02
	AT 12	CCTV Pole Foundation For Dedicated CCTV Pole	07/03/02
	AT 13	120V VMS Cab Foundation Details	07/03/02
	AT 14	Weigh In Motion Piezo Detail	07/03/02
		Barriers (BA)	
	BA 1A	Precast Concrete Full Barrier Standard Section	12/19/02
	BA 1B	Precast Concrete Full Barrier Standard Section	12/19/02
	BA 2	Precast Concrete Half Barrier Standard Section	07/03/02
	BA 3	Cast In Place Constant Slope Barrier	12/19/02
	BA 4	Beam Guardrail Hardware	07/03/02
	BA 4A	Guardrail Transition	07/03/02
	BA 4B	Beam Guardrail Installation	12/19/02
	BA 4C	Beam Guardrail Anchor Type I	12/19/02
	BA 5	Traffic Control Cable	07/03/02

U	NUMBER	TITLE	CURRENT DATE
		Catch Basins and Cleanouts (CB)	
	CB 1	Standard Catch Basin	07/03/02
	CB 2	Curb Inlet Catch Basin	04/24/02
	CB 3	Standard Transition Concrete Lined Ditch To Pipe Or Diversion Box	07/03/02
	CB 4	Solid Cover For Standard Drawing DB 1 MS-18 Loading	07/03/02
	CB 5	Standard Screw Gate And Frame	07/03/02
	CB 6A	Standard Drop Inlet Details General Notes And Installation Detail	07/03/02
	CB 6B	Standard Catch Basin And Cleanout Box Drop Inlet Type "A" Details	07/03/02
	CB 6C	Standard Catch Basin And Cleanout Box Drop Inlet Type "B" Details	07/03/02
	CB 6D	Standard Catch Basin And Cleanout Box Drop Inlet Type "C" Details	07/03/02
	CB 6E	Standard Catch Basin And Cleanout Box Drop Inlet With Attached Apron Details	07/03/02
	CB 6F	Standard Catch Basin And Cleanout Box Drop Inlet With Attached Apron Details	07/03/02
	CB 6G	Standard Catch Basin And Cleanout Box Drop Inlet Type "D" Details	07/03/02
	CB 6H	Standard Catch Basin And Cleanout Box Drop Inlet Type "D" Tables	07/03/02
	CB 7	Standard Curb And Gutter Drop Inlet	07/03/02
	CB 8A	Double Catch Basin	07/03/02
	CB 8B	Double Catch Basin	07/03/02
	CB 9A	Standard Catch Basin and Cleanout Box Situation & Layout	07/03/02
	CB 9B	Standard Catch Basin and Cleanout Box Section Details	07/03/02
	CB 9C	Standard Catch Basin and Cleanout Box Schedule Of Installation 18" to 42" RCP 12" to 48" CMP	07/03/02
	CB 9D	Standard Catch Basin and Cleanout Box Schedule Of Installation 48" to 66" RCP 60" to 78" CMP	07/03/02
	CB 10A	Standard Catch Basin and Cleanout Box Situation & Layout	07/03/02
	CB 10B	Standard Catch Basin and Cleanout Box Section Details	07/03/02
	CB 10C	Standard Catch Basin and Cleanout Box Schedule Of Installation 42" to 60" RCP 48" to 72" CMP	07/03/02

U	NUMBER	TITLE	CURRENT DATE
		Crash Cushions (CC)	
	CC 1	Crash Cushion Markings	07/03/02
	CC 2	Crash Cushion Drainage Details Guideline A	07/03/02
	CC 3	Crash Cushion Drainage Details Guideline B	07/03/02
	CC 4	Details For Placement Crash Cushions Type A, B, & D	07/03/02
	CC 5	Grading And Placement Detail Crash Cushion Type C	07/03/02
	CC 6	Crash Cushion Type E Sand Barrel Details	12/19/02
	CC 7	Grading & Installation Details Crash Cushion Type F	04/24/03
	CC 8	Grading & Installation Details Crash Cushion Type G	04/24/03
	CC 9A	Grading & Installation Details Crash Cushion Type H	04/24/03
	CC 9B	Grading & Installation Details Crash Cushion Type H	04/24/03
		Diversion Boxes (DB)	
	DB 1A	Standard Diversion Box/Cover Plate/Grating For 18" DIA. or 24" DIA. Pipe	07/03/02
	DB 1B	Standard Diversion Box Hinged Lid Details For 18" DIA. or 24" DIA. Pipe	07/03/02
	DB 1C	Standard Diversion Box Bicycle - Safe Grating Details For 18" DIA. or 24" DIA. Pipe	07/03/02
	DB 1D	Standard Diversion Box Three Gate Box Sections For 18" DIA. or 24" DIA. Pipe	07/03/02
	DB 1E	Standard Diversion Box Three Gate Box Sections For 18" DIA. or 24" DIA. Pipe	07/03/02
	DB 1F	Standard Diversion Box Three Gate Box Sections For 18" DIA. or 24" DIA. Pipe	07/03/02
	DB 2A	Standard Diversion Box w/Interchangeable Walls, Bottom Slab, Walls and Apron Detail	07/03/02
	DB 2B	Standard Diversion Box w/Interchangeable Walls, Quantities Schedule	07/03/02
	DB 2C	Standard Diversion Box w/Interchangeable Walls, Hand Slide Gate Details	07/03/02
	DB 2D	Standard Diversion Box Type "G" Hand Slide Details	07/03/02
	DB 2E	Standard Diversion Box Hinged Lid (Solid Cover Plate) Type "A" Details Type I Plan	07/03/02
	DB 2F	Standard Diversion Box Hinged Lid (Solid Cover Plate) Type "A" Details Type II Plan	07/03/02
	DB 2G	Standard Diversion Box Hinged Lid Solid Cover Type "B" Details	07/03/02

U	NUMBER	TITLE	CURRENT DATE
	DB 2H	Standard Diversion Box Hinged Lid Solid Cover Type "B" & "C" Details	07/03/02
	DB 3A	Standard Diversion Box With Manhole Cover Situation And Layout	07/03/02
	DB 3B	Standard Diversion Box With Manhole Cover Up To 42" RCP and Up To 54" CMP	07/03/02
	DB 3C	Standard Diversion Box With Manhole Cover 48" - 72" RCP and 60" to 84" CMP	07/03/02
		Design Drawings (DD)	
	DD 1	Superelevation and Widening	06/26/03
	DD 2	Slope Rounding, Benched Slope, and Cut Ditch Details	08/28/03
	DD 3	Climbing Lanes	06/26/03
	DD 4	Geometric Design for Freeways (Roadway)	08/28/03
	DD 5	Entrance and Exit Ramps At Crossroads	08/28/03
	DD 6	Entrance and Exit Ramp Geometrics	08/28/03
	DD 7	Freeway Crossover	08/28/03
	DD 8	Structural Geometric Design Standards Clearances	06/26/03
	DD 9	Structural Geometric Design Standards	06/26/03
	DD 10	Railroad Clearances At Highway Overpass Structures	06/26/03
	DD 11	Rural Multi Lane Highways Other Than Freeways	06/26/03
	DD 12	Rural Two Lane Highways	06/26/03
	DD 13	Frontage and Access Roads (Under 50 ADT)	06/26/03
	DD 14	Typical Rural 2 Lane Road With Median Lane and Deceleration Lane For Intersecting Crossroads	08/28/03
		Drainage (DG)	
	DG 1	Fill Height for Metal Pipe (Steel)	07/03/02
	DG 2	Fill Height for Metal Pipe (Aluminum)	07/03/02
	DG 3	Maximum Fill Height and End Sections For HDPE and PVC Pipes	12/19/02
	DG 4	Pipe Culverts Minimum Cover	12/19/02
	DG 5	Plastic Pipe, Metal Pipe or Pipe Arch Culvert Bedding	07/03/02
	DG 6	Precast Concrete Pipe Culvert	07/03/02
	DG 7	Gasketted Joints or Coupling Bands for C.M.P.	07/03/02

U	NUMBER	TITLE	CURRENT DATE
	DG 8	Metal Culvert End Sections	07/03/02
	DG 9	Miscellaneous Pipe Details	07/03/02
		Environmental Controls (EN)	
	EN 1	Temporary Erosion Control (Check Dams)	07/03/02
	EN 2	Temporary Erosion Control (Silt Fence)	04/24/03
	EN 3	Temporary Erosion Control (Slope Drain and Temporary Berm)	07/03/02
	EN 4	Temporary Erosion Control (Drop Inlet Barriers)	12/19/02
	EN 5	Temporary Erosion Control (Sediment Trap and Curb Inlet Barrier)	07/03/02
		Fence and Gates (FG)	
	FG 1A	Right-of-Way Fence and Gates (Wood Posts)	07/03/02
	FG 1B	Right-of-Way Fence and Gates (Wood Posts)	07/03/02
	FG 2A	Right-of-Way Fence and Gates (Metal Posts)	07/03/02
	FG 2B	Right-of-Way Fence and Gates (Metal Posts)	07/03/02
	FG 3	Swing Gates Type I for Gates Less Than 17'	07/03/02
	FG 4	Deer Gates	07/03/02
	FG 5	Swing Gates Type II for Gates Wider Than 17'	07/03/02
	FG 6	Chain Link Fence	07/03/02
		Grates, Frames, and Trash Racks (GF)	
	GF 1	Manhole Frame And Grated Cover	07/03/02
	GF 2	Manhole Frame And Solid Cover	07/03/02
	GF 3	Rectangle Grate & Frame	07/03/02
	GF 4	Directional Flow Grate & Frame	07/03/02
	GF 5	Solid Cover & Frame	07/03/02
	GF 6	Manhole Steps	07/03/02
	GF 7	Standard Screw Grate & Frame	07/03/02
	GF 8	2' x 2' Grate & Frame	07/03/02
	GF 9	28" x 24" Directional Flow and Frame	07/03/02
	GF 10	Standard Trash Racks 90E X-ing L	07/03/02

U	NUMBER	TITLE	CURRENT DATE
	GF 11	Standard Trash Racks	07/03/02
	GF 12	Standard Trash Racks	07/03/02
		General Road Work (GW)	
	GW 1	Raised Median and Plowable End Section	12/19/02
	GW 2	Concrete Curb and Gutter	06/26/03
	GW 3	Concrete Curb and Gutter Details	07/03/02
	GW 4	Concrete Driveways and Sidewalks	07/03/02
	GW 5	Pedestrian Access	02/27/03
	GW 6	Right-of-Way Marker	07/03/02
	GW 7	Newspaper and Mailbox Stop Layout	07/03/02
	GW 8	Newspaper and Mailbox Support Hardware	07/03/02
	GW 9	Delineation Hardware	08/28/03
	GW 10	Delineation Application	08/28/03
	GW 11	Sidewalks and Shoulders On Urban Roadways	08/28/03
		Paving (PV)	
	PV 1	Joints for Highways with Concrete Traffic Lanes and Shoulders	07/03/02
	PV 2	Pavement/Approach Slab Details	12/19/02
	PV 3	Concrete Pavement Details for Urban and Interstate	07/03/02
	PV 4	Concrete Pavement Details for Urban and Interstate	07/03/02
	PV 5	Urban Concrete Pavement Details	07/03/02
	PV 6	Rumble Strips	07/03/02
	PV 7	Rumble Strips - Typical Application	07/03/02
		Signals (SL)	
	SL 1	Traffic Signals Mast Arm Pole and Luminaire Extension	07/03/02
	SL 2	Traffic Signals Mast Arm Detail 25' Thru 65'	07/03/02
	SL 3	Underground Service Pedestal Details	07/03/02
	SL 4	Traffic Signals Mast Arm Pole Foundation	07/03/02
	SL 5	Breakaway Post Mounted Traffic Signal Pole	07/03/02
	SL 6	Power Source Details	07/03/02

U	NUMBER	TITLE	CURRENT DATE
	SL 7	Span Wire Signal Pole Detail	07/03/02
	SL 8	Signal Head Details	07/03/02
	SL 9	Pedestrian Signal Assembly	07/03/02
	SL 10	Controller Base Details	07/03/02
	SL 11	Traffic Signals Loop Detector Detail	07/03/02
	SL 12	Junction Box Details	07/03/02
	SL 13	Traffic Counting Loop Detector Detail	12/19/02
	SL 14	Light Pole Breakaway Base	07/03/02
	SL 15	Luminaire Breakaway Base Detail	07/03/02
	SL 16	Single Transformer Substation Details	07/03/02
	SL 17	Light Pole Anchor Base	07/03/02
	SL 18	Light Pole Foundation Extension	07/03/02
		Signs (SN)	
	SN 1	Bridge Load Limit Signs	07/03/02
	SN 2	Flashing School Sign	12/19/02
	SN 3	Overhead School Flasher	07/03/02
	SN 4	Flashing Stop Sign	12/19/02
	SN 5	Typical Installation for Milepost Signs	12/19/02
	SN 6	Not Used	
	SN 7	Placement of Ground Mounted Signs	07/03/02
	SN 8	Ground Mounted Timber Sign Post (P1)	12/19/02
	SN 9	Ground Mounted Tubular Steel Sign Post (P2)	07/03/02
	SN 10	Ground Mounted Square Steel Sign Post (P3)	07/03/02
	SN 11	Slipbase Ground Mounted Tubular Steel Sign Post (P4)	07/03/02
	SN 12A	Ground Mounted Sign Installation Details	07/03/02
	SN 12B	Ground Mounted Sign Installation Details	04/24/03
	SN 12C	Ground Mounted Sign Installation Details	07/03/02
		Striping (ST)	
	ST 1	Object Markers "T" Intersection & Pavement Transition Guidance	12/19/02

U	NUMBER	TITLE	CURRENT DATE
	ST 2	Freeway Crossover Markings	08/28/03
	ST 3	Typical Pavement Markings	07/03/02
	ST 4	Crosswalks, Parking and Intersection Approaches	07/03/02
	ST 5	Painted Median & Auxiliary Lane Details	07/03/02
	ST 6	Passing/Climbing Lanes Traffic Control	07/03/02
	ST 7	Pavement Markings & Signs at Railroad Crossing	12/19/02
	ST 8	Plowable Pavement Markers	07/03/02
	ST 9	School Crossing and School Message	08/28/03
		Structures and Walls (SW)	
	SW 1A	Welded End Guard Unit	07/03/02
	SW 1B	Precast Concrete Cattle Guard	07/03/02
	SW 2	Noise Wall Placement Area	07/03/02
	SW 3A	Precast Concrete Noise Wall 1 of 2	12/19/02
	SW 3B	Precast Concrete Noise Wall 2 of 2	12/19/02
	SW 4A	Precast Concrete Retaining/Noise Wall 1 of 2	12/19/02
	SW 4B	Precast Concrete Retaining/Noise Wall 2 of 2	07/03/02
		Traffic Control (TC)	
	TC 1A	Construction Zone Channelization Devices	07/03/02
	TC 1B	Construction Zone Signing	07/03/02
	TC 2A	Traffic Control General	07/03/02
	TC 2B	Traffic Control General	07/03/02
	TC 3	Traffic Control Project Limit Signing	07/03/02
	TC 4	Traffic Control Urban Intersections With Roadways Under 50 MPH	07/03/02
	TC 5	Traffic Control Urban Intersections With Roadways Under 50 MPH	07/03/02
	TC 6	Traffic Control Pedestrian Routing	07/03/02
	TC 7	Traffic Control Road Closed, Detour	07/03/02
	TC 8	Traffic Control Lane Closure	07/03/02
	TC 9	Traffic Control Multilane Closure	07/03/02

U	NUMBER	TITLE	CURRENT DATE
	TC 10	Traffic Control Expressway And Freeway Crossover/Turn-Around	07/03/02
	TC 11	Traffic Control Exit Ramp Gore	07/03/02
	TC 12	Traffic Control Entrance Ramp Gore	07/03/02
	TC 13	Traffic Control Shoulder-Haul Road	07/03/02
	TC 14	Traffic Control Flagging Operation	07/03/02
	TC 15	Traffic Control 2 Lane/ 2 Way Seal Coat With Cover Material	07/03/02
	TC 16	Traffic Control Pavement Marking	07/03/02

Listing of Revised Standard Drawings

Change Five

Revised August 28, 2003

DD 2	Slope Rounding, Benched Slope, and Cut Ditch Details	08/28/03 (New)
DD 4	Geometric Design for Freeways (Roadway)	08/28/03 (New)
DD 5	Entrance and Exit Ramps At Crossroads	08/28/03 (New)
DD 6	Entrance and Exit Ramp Geometrics	08/28/03 (New)
DD 7	Freeway Crossover	08/28/03 (New)
DD 14	Typical Rural 2 Lane Road With Median Lane and Deceleration Lane For Intersecting Crossroads	08/28/03 (New)
GW 9	Delineation Hardware	08/28/03
GW 10	Delineation Application	08/28/03
GW 11	Sidewalks and Shoulders On Urban Roadways	08/28/03 (New)
ST 2	Freeway Crossover Markings	08/28/03
ST 9	School Crossing and School Message	08/28/03 (New)

UTAH DEPARTMENT OF TRANSPORTATION

STANDARD DRAWINGS FOR ROAD AND BRIDGE CONSTRUCTION

DWG. NO.	DESCRIPTION	DATE
	Advanced Traffic Management System (AT)	
AT 1	LEGEND SHEET	07-03-02
AT 2	RAMP METER DETAILS	07-03-02
AT 3	RAMP METER SIGN PANEL	07-03-02
AT 4	TYPICAL RAMP METER SIGNAL HEAD MOUNTING	07-03-02
AT 5	LOOP INSTALLATION	07-03-02
AT 6	CONDUIT DETAILS	07-03-02
AT 7	POLYMER-CONCRETE JUNCTION BOX DETAILS	04-24-03
AT 8	ATMS CABINET W/120V DISCONNECT	07-03-02
AT 9	ATMS CAB WITH STEPDOWN TRANSFORMER	07-03-02
AT 10	DOMED CCTV DETAILS	07-03-02
AT 11	CCTV POLE DETAIL	07-03-02
AT 12	CCTV POLE FOUNDATION FOR DEDICATED CCTV POLE	07-03-02
AT 13	120V VMS CAB FOUNDATION DETAILS	07-03-02
AT 14	WEIGHT IN MOTION PIEZO DETAIL	07-03-02
	Barriers (BA)	
BA 1A	PRECAST CONCRETE FULL BARRIER STANDARD SECTION	12-19-02
BA 1B	PRECAST CONCRETE FULL BARRIER STANDARD SECTION	12-19-02
BA 2	PRECAST CONCRETE HALF BARRIER STANDARD SECTION	07-03-02
BA 3	CAST IN PLACE CONSTANT SLOPE BARRIER	12-19-02
BA 4	BEAM GUARDRAIL HARDWARE	07-03-02
BA 4A	GUARDRAIL TRANSITION	07-03-02
BA 4B	BEAM GUARDRAIL INSTALLATIONS	12-19-02
BA 4C	BEAM GUARDRAIL ANCHOR TYPE 1	12-19-02
BA 5	TRAFFIC CONTROL CABLE	07-03-02
	Catch Basins and Cleanouts (CB)	
CB 1	STANDARD CATCH BASIN	07-03-02
CB 2	CURB INLET CATCH BASIN	04-24-03
CB 3	STANDARD TRANSITION CONCRETE LINED DITCH TO PIPE OR DIVERSION BOX	07-03-02
CB 4	SOLID COVER FOR STD DWG DB 1 MS-18 LOADING	07-03-02
CB 5	STANDARD SCREW GATE AND FRAME	07-03-02
CB 6A	STANDARD DROP INLET DETAILS GENERAL NOTES AND INSTALLATION DETAIL	07-03-02
CB 6B	STANDARD CATCH BASIN AND CLEANOUT BOX DROP INLET TYPE "A" DETAIL	07-03-02
CB 6C	STANDARD CATCH BASIN AND CLEANOUT BOX DROP INLET TYPE "B" DETAILS	07-03-02
CB 6D	STANDARD CATCH BASIN AND CLEANOUT BOX DROP INLET TYPE "C" DETAILS	07-03-02
CB 6E	STANDARD CATCH BASIN AND CLEANOUT BOX DROP INLET WITH ATTACHED APRON DETAILS	07-03-02
CB 6F	STANDARD CATCH BASIN AND CLEANOUT BOX DROP INLET WITH ATTACHED APRON DETAILS	07-03-02
CB 6G	STANDARD CATCH BASIN AND CLEANOUT BOX DROP INLET TYPE "D" DETAILS	07-03-02
CB 6H	STANDARD CATCH BASIN AND CLEANOUT BOX DROP INLET TYPE "D" TABLES	07-03-02
CB 7	STANDARD CURB AND GUTTER DROP INLET	07-03-02
CB 8A	DOUBLE CATCH BASIN	07-03-02
CB 8B	DOUBLE CATCH BASIN	07-03-02
CB 9A	STANDARD CATCH BASIN AND CLEANOUT BOX SITUATION & LAYOUT	07-03-02
CB 9B	STANDARD CATCH BASIN AND CLEANOUT BOX SECTION DETAILS	07-03-02
CB 9C	STANDARD CATCH BASIN AND CLEANOUT BOX SCHEDULE OF INSTALLATION 18" TO 42" RCP 12" TO 48" CMP	07-03-02
CB 9D	STANDARD CATCH BASIN AND CLEANOUT BOX SCHEDULE OF INSTALLATION 48" TO 66" RCP 60" TO 78"CPM	07-03-02
CB 10A	STANDARD CATCH BASIN AND CLEANOUT BOX SITUATION & LAYOUT	07-03-02
CB 10B	STANDARD CATCH BASIN AND CLEANOUT BOX SECTION DETAILS	07-03-02
CB 10C	STANDARD CATCH BASIN AND CLEANOUT BOX SCHEDULE OF INSTALLATION 42" TO 60" RCP 48" TO 72" CMP	07-03-02
	Crash Cushions (CC)	
CC 1	CRASH CUSHION MARKINGS	07-03-02
CC 2	CRASH CUSHION DRAINAGE DETAILS GUIDELINE A	07-03-02
CC 3	CRASH CUSHION DRAINAGE DETAILS GUIDELINE B	07-03-02
CC 4	DETAIL FOR PLACEMENT CRASH CUSHIONS TYPE A, B & D	07-03-02
CC 5	GRADING & PLACEMENT DETAIL CRASH CUSHION TYPE C	07-03-02
CC 6	CRASH CUSHION TYPE E SAND BARREL DETAILS	12-19-02
CC 7	GRADING & INSTALLATION DETAILS CRASH CUSHION TYPE F	04-24-03
CC 8	GRADING & INSTALLATION DETAILS CRASH CUSHION TYPE G	04-24-03
CC 9A	GRADING & INSTALLATION DETAILS CRASH CUSHION TYPE H	04-24-03
CC 9B	GRADING & INSTALLATION DETAILS CRASH CUSHION TYPE H	04-24-03
	Diversion Boxes (DB)	
DB 1A	STANDARD DIVERSION BOX/COVER PLATE/GRATING FOR 18"DIA. OR 24"DIA.PIPE	07-03-02
DB 1B	STANDARD DIVERSION BOX HINGED LID DETAIL FOR 18" DIA OR 24" DIA.PIPE	07-03-02
DB 1C	STANDARD DIVERSION BOX BICYCLE-SAFE GRATING DETAILS FOR 18"DIA. OR 24"DIA.PIPE	07-03-02
DB 1D	STANDARD DIVERSION BOX THREE GATE BOX SECTIONS FOR 18"DIA. OR 24"DIA.PIPE	07-03-02
DB 1E	STANDARD DIVERSION BOX THREE GATE BOX SECTIONS FOR 18"DIA. OR 24"DIA.PIPE	07-03-02
DB 1F	STANDARD DIVERSION BOX THREE GATE BOX SECTIONS FOR 18"DIA. OR 24"DIA.PIPE	07-03-02
DB 2A	STANDARD DIVERSION BOX W/INTERCHANGEABLE WALLS, BOTTOM SLAB, WALLS AND APRON DETAIL	07-03-02
DB 2B	STANDARD DIVERSION BOX W/INTERCHANGEABLE WALLS, QUANTITIES SCHEDULE	07-03-02
DB 2C	STANDARD DIVERSION BOX W/INTERCHANGEABLE WALLS, HAND SLIDE GATE DETAILS	07-03-02
DB 2D	STANDARD DIVERSION BOX TYPE "G" HAND SLIDE GATE DETAILS	07-03-02
DB 2E	STANDARD DIVERSION BOX HINGED LID (SOLID COVER PLATE) TYPE "A" DETAILS TYPE I PLAN	07-03-02
DB 2F	STANDARD DIVERSION BOX HINGED LID (SOLID COVER PLATE) TYPE "A" DETAILS TYPE II PLAN	07-03-02
DB 2G	STANDARD DIVERSION BOX HINGED LID SOLID COVER TYPE "B"DETAILS	07-03-02
DB 2H	STANDARD DIVERSION BOX HINGED LID SOLID COVER TYPE "B" & "C"DETAILS	07-03-02
DB 3A	STANDARD DIVERSION BOX WITH MANHOLE COVER SITUATION & LAYOUT	07-03-02
DB 3B	STANDARD DIVERSION BOX WITH MANHOLE COVER UP TO 42" RCP AND UP TO 54" CMP	07-03-02
DB 3C	STANDARD DIVERSION BOX WITH MANHOLE COVER 48"TO 72" RCP AND 60"TO 84" CMP	07-03-02
	Design (DD)	
DD 1	SUPERELEVATION AND WIDENING	06-26-03
DD 2	SLOPE ROUNDING, BENCHED SLOPE, AND CUT DITCH DETAILS	08-28-03
DD 3	CLIMBING LANES	06-26-03
DD 4	GEOMETRIC DESIGN FOR FREEWAYS (ROADWAY)	08-28-03
DD 5	ENTRANCE AND EXIT RAMPS AT CROSSROADS	08-28-03
DD 6	ENTRANCE AND EXIT RAMP GEOMETRICS	08-28-03
DD 7	FREEWAY CROSSOVER	08-28-03
DD 8	STRUCTURAL GEOMETRIC DESIGN STANDARDS CLEANERS	06-26-03
DD 9	STRUCTURAL GEOMETRIC DESIGN STANDARDS	06-26-03
DD 10	RAILROAD CLEARANCES AT HIGHWAY OVERPASS STRUCTURES	06-26-03
DD 11	RURAL MULTILANE HIGHWAYS OTHER THAN FREEWAYS	06-26-03
DD 12	RURAL TWO LANE HIGHWAYS	06-26-03
DD 13	FRONTAGE AND ACCESS ROADS (UNDER 50 ADT)	06-26-03
DD 14	TYPICAL RURAL 2 LANE ROAD WITH MEDIAN LANE AND DECELERATION LANE FOR INTERSECTING CROSSROADS	08-28-03
	Drainage (DG)	
DG 1	FILL HEIGHT FOR METAL PIPE (STEEL)	07-03-02
DG 2	FILL HEIGHT FOR METAL PIPE (ALUMINUM)	07-03-02
DG 3	MAXIMUM FILL HEIGHT AND END SECTIONS FOR HDPE AND PVC PIPES	12-19-02
DG 4	PIPE CULVERTS MINIMUM COVER	12-19-02
DG 5	PLASTIC PIPE, METAL PIPE OR PIPE ARCH CULVERT BEDDING	07-03-02
DG 6	PRECAST CONCRETE PIPE CULVERT	07-03-02
DG 7	GASKETTED JOINTS OR COUPLINGS BANDS FOR C.M.P.	07-03-02
DG 8	METAL CULVERT END SECTION	07-03-02
DG 9	MISCELLANEOUS PIPE DETAILS	07-03-02
	Environmental Controls (EN)	
EN 1	TEMPORARY EROSION CONTROL (CHECK DAMS)	07-03-02
EN 2	TEMPORARY EROSION CONTROL (SILT FENCE)	04-24-03
EN 3	TEMPORARY EROSION CONTROL (SLOPE DRAIN AND TEMPORARY BERM)	07-03-02
EN 4	TEMPORARY EROSION CONTROL (DROP INLET BARRIERS)	12-19-02
EN 5	TEMPORARY EROSION CONTROL (SEDIMENT TRAP AND CURB INLET BARRIER)	07-03-02
	Fence and Gates (FG)	
FG 1A	RIGHT OF WAY FENCE AND GATES (WOOD POST)	07-03-02
FG 1B	RIGHT OF WAY FENCE AND GATES (WOOD POST)	07-03-03
FG 2A	RIGHT OF WAY FENCE AND GATES (METAL POST)	07-03-02
FG 2B	RIGHT OF WAY FENCE AND GATES (METAL POST)	07-03-02
FG 3	SWING GATES TYPE 1 FOR GATES LESS THAN 17'	07-03-02
FG 4	DEER GATES	07-03-02
FG 5	SWING GATES TYPE II FOR GATES WIDER THAN 17'	07-03-02
FG 6	CHAIN LINK FENCE	07-03-02

☒ MARKED BOXES INDICATE DRAWINGS APPLICABLE TO THIS PROJECT

REVISIONS

NO.	DATE	APPR.	REMARKS
1	02/19/03	B.A.	CHANGE 1
2	04/24/03	B.A.	CHANGE 3
3	06/26/03	B.A.	CHANGE 4
4	08/28/03	B.A.	CHANGE 5

UTAH DEPARTMENT OF TRANSPORTATION
STANDARD DRAWINGS FOR ROAD AND BRIDGE CONSTRUCTION
SALT LAKE CITY, UTAH

REVIEWED AND CHECKED — AUG.28,2003 DATE

CHECKED AND APPROVAL — AUG.28,2003 DATE

STANDARD ENGINEER

STANDARD DRAWING INDEX SHEET

STANDARD DRAWING TITLE

STD DWG
1-B

DGN File:N:\Esd\Standard_Drawings\Imperial\Approved\sheet1b.dgn
22-SEP-2003

UTAH DEPARTMENT OF TRANSPORTATION

STANDARD DRAWINGS FOR ROAD AND BRIDGE CONSTRUCTION

DWG. NO.	DESCRIPTION	DATE
	Grates, Frames and Trash Racks (GF)	
GF 1	MANHOLE FRAME AND GRATED COVER	07-03-02
GF 2	MANHOLE FRAME AND SOLID COVER	07-03-02
GF 3	RECTANGULAR GRATE & FRAME	07-03-02
GF 4	DIRECTIONAL FLOW GRATE & FRAME	07-03-02
GF 5	SOLID COVER & FRAME	07-03-02
GF 6	MANHOLE STEPS	07-03-02
GF 7	STANDARD SCREW GATE & FRAME	07-03-02
GF 8	2' x 2' GATE AND FRAME	07-03-02
GF 9	28" x 24" DIRECTIONAL FLOW GRATE AND FRAME	07-03-02
GF 10	STANDARD TRASH RACKS 90° ANGLE X-ING L	07-03-02
GF 11	STANDARD TRASH RACKS	07-03-02
GF 12	STANDARD TRASH RACKS	07-03-02
	General Road Work (GW)	
GW 1	RAISED MEDIAN AND PLOWABLE END SECTION	12-19-02
GW 2	CONCRETE CURB AND GUTTER	06-26-03
GW 3	CONCRETE CURB AND GUTTER DETAILS	07-03-02
GW 4	CONCRETE DRIVEWAYS AND SIDEWALKS	07-03-02
GW 5	PEDESTRIAN ACCESS	02-27-03
GW 6	RIGHT OF WAY MARKER	07-03-02
GW 7	NEWSPAPER AND MAILBOX STOP LAYOUT	07-03-02
GW 8	NEWSPAPER AND MAILBOX SUPPORT HARDWARE	07-03-02
GW 9	DELINEATION HARDWARE	08-28-03
GW 10	DELINEATION APPLICATION	08-28-03
GW 11	SIDEWALKS AND SHOULDERS ON URBAN ROADWAYS	08-28-03
	Paving (PV)	
PV 1	JOINTS FOR HIGHWAYS WITH CONCRETE TRAFFIC LANES AND SHOULDERS	07-03-02
PV 2	PAVEMENT/APPROACH SLAB DETAILS	12-19-02
PV 3	CONCRETE PAVEMENT DETAILS FOR URBAN AND INTERSTATE	07-03-02
PV 4	CONCRETE PAVEMENT DETAILS FOR URBAN AND INTERSTATE	07-03-02
PV 5	URBAN CONCRETE PAVEMENT DETAILS	07-03-02
PV 6	RUMBLE STRIPS	07-03-02
PV 7	RUMBLE STRIPS -TYPICAL APPLICATION	07-03-02
	Signals (SL)	
SL 1	TRAFFIC SIGNALS MAST ARM POLE AND LUMINAIRE EXTENSION	07-03-02
SL 2	TRAFFIC SIGNALS MAST ARM DETAIL 25' THRU 65'	07-03-02
SL 3	UNDERGROUND SERVICE PEDESTAL DETAIL	07-03-02
SL 4	TRAFFIC SIGNALS MAST ARM POLE FOUNDATION	07-03-02
SL 5	BREAKAWAY POST MOUNTED TRAFFIC SIGNAL POLE	07-03-02
SL 6	POWER SOURCE DETAILS	07-03-02
SL 7	SPAN WIRE SIGNAL POLE DETAIL	07-03-02
SL 8	SIGNAL HEAD DETAILS	07-03-02
SL 9	PEDESTRIAN SIGNAL ASSEMBLY	07-03-02
SL 10	CONTROLLER BASE DETAIL	07-03-02
SL 11	TRAFFIC SIGNALS LOOP DETECTOR DETAIL	07-03-02
SL 12	JUNCTION BOX DETAILS	07-03-02
SL 13	TRAFFIC COUNTING LOOP DETECTOR DETAIL	12-19-02
SL 14	LIGHT POLE BREAKAWAY BASE	07-03-02
SL 15	LUMINARIE BREAKAWAY BASE DETAIL	07-03-02
SL 16	SINGLE TRANSFORMER SUBSTATION DETAILS	07-03-02
SL 17	LIGHT POLE ANCHOR BASE	07-03-02
SL 18	LIGHT POLE FOUNDATION EXTENSION	07-03-02
	SIgns (SN)	
SN 1	BRIDGE LOAD LIMITS SIGNS	07-03-02
SN 2	FLASHING SCHOOL SIGN	12-19-02
SN 3	OVERHEAD SCHOOL FLASHER	07-03-02
SN 4	FLASHING STOP SIGN	12-19-02
SN 5	TYPICAL INSTALLATION FOR MILEPOST SIGNS	12-19-02
SN 6	NOT USED	07-03-02
SN 7	PLACEMENT OF GROUND MOUNTED SIGNS	07-03-02
SN 8	GROUND MOUNTED TIMBER SIGN POST (P1)	12-19-02
SN 9	GROUND MOUNTED TUBULAR STEEL SIGN POST (P2)	07-03-02
SN 10	GROUND MOUNTED SQUARE STEEL SIGN POST (P3)	07-03-02
SN 11	SLIPBASE GROUND MOUNTED TUBULAR STEEL SIGN POST (P-4)	07-03-02
SN 12A	GROUND MOUNTED SIGN INSTALLATION DETAILS	07-03-02
SN 12B	GROUND MOUNTED SIGN INSTALLATION DETAILS	04-24-03
SN 12C	GROUND MOUNTED SIGN INSTALLATION DETAILS	07-03-02
	Striping (ST)	
ST 1	OBJECT MARKERS "T" INTERSECTION & PAVEMENT TRANSITION GUIDANCE	12-19-02
ST 2	FREEWAY CROSSOVER MARKINGS	08-28-03
ST 3	TYPICAL PAVEMENT MARKINGS	07-03-02
ST 4	CROSSWALKS, PARKING AND INTERSECTION APPROACHES	07-03-02
ST 5	PAINTED MEDIAN & AUXILIARY LANE DETAILS	07-03-02
ST 6	PASSING/CLIMBING LANES TRAFFIC CONTROL	07-03-02
ST 7	PAVEMENT MARKINGS AND SIGNS AT RAILROAD CROSSING	12-19-02
ST 8	PLOWABLE PAVEMENT MARKERS	07-03-02
ST 9	SCHOOL CROSSING AND SCHOOL MESSAGE	08-28-03
	Structures and Walls (SW)	
SW 1A	WELDED END GUARD UNIT	07-03-02
SW 1B	PRECAST CONCRETE CATTLE GUARD	07-03-02
SW 2	NOISE WALL PLACEMENT AREA	07-03-02
SW 3A	PRECAST CONCRETE NOISE WALL 1 OF 2	12-19-02
SW 3B	PRECAST CONCRETE NOISE WALL 2 0F 2	12-19-02
SW 4A	PRECAST CONCRETE RETAINING/NOISE WALL 1 OF 2	12-19-02
SW 4B	PRECAST CONCRETE RETAINING/NOISE WALL 2 OF 2	07-03-02
	Traffic Control (TC)	
TC 1A	CONSTRUCTION ZONE CHANNELIZATION DEVICES	07-03-02
TC 1B	CONSTRUCTION ZONE SIGNING	07-03-02
TC 2A	TRAFFIC CONTROL GENERAL	07-03-02
TC 2B	TRAFFIC CONTROL GENERAL	07-03-02
TC 3	TRAFFIC CONTROL PROJECT LIMIT SIGNING	07-03-02
TC 4	TRAFFIC CONTROL URBAN INTERSECTION WITH ROADWAYS UNDER 50 MPH	07-03-02
TC 5	TRAFFIC CONTROL URBAN INTERSECTION WITH ROADWAYS UNDER 50 MPH	07-03-02
TC 6	TRAFFIC CONTROL PEDESTRIAN ROUTING	07-03-02
TC 7	TRAFFIC CONTROL ROAD CLOSURE, DETOUR	07-03-02
TC 8	TRAFFIC CONTROL LANE CLOSURE	07-03-02
TC 9	TRAFFIC CONTROL MULTILANE CLOSURE	07-03-02
TC 10	TRAFFIC CONTROL EXPRESSWAY AND FREEWAY CROSSOVER/ TURN AROUND	07-03-02
TC 11	TRAFFIC CONTROL EXIT RAMP GORE	07-03-02
TC 12	TRAFFIC CONTROL ENTRANCE RAMP GORE	07-03-02
TC 13	TRAFFIC CONTROL SHOULDER-HAUL ROAD	07-03-02
TC 14	TRAFFIC CONTROL FLAGGING OPERATION	07-03-02
TC 15	TRAFFIC CONTROL 2 LANE / 2 WAY SEAL COAT WITH COVER MATERIAL	07-03-02
TC 16	TRAFFIC CONTROL PAVEMENT MARKING	07-03-02

☒ **MARKED BOXES INDICATE DRAWINGS APPLICABLE TO THIS PROJECT**

REVISIONS

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UTAH DEPARTMENT OF TRANSPORTATION
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SALT LAKE CITY, UTAH

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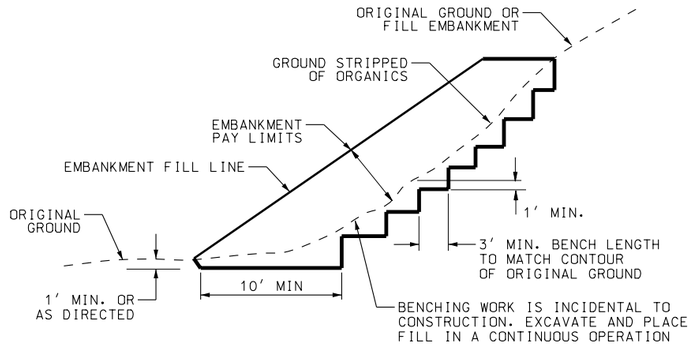
STANDARD ENGINEER

STANDARD DRAWING INDEX SHEET

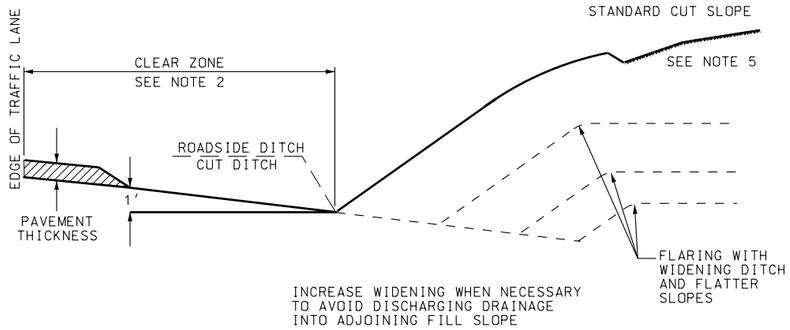
STANDARD DRAWING TITLE

STD DWG
1-C

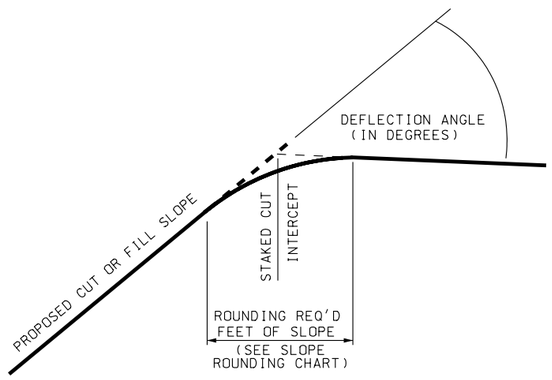
DGN File:N:\Esd\Standard_Drawings\Imperial\Approved\sheet1a.dgn
17-SEP-2003



BENCHED SLOPE DETAIL



CUT DITCH FLARING DETAIL



SLOPE ROUNDING DETAIL

SLOPE ROUNDING CHART (FEET)					
		SLOPE HEIGHT (FEET)			
		5-15	15-30	30-60	60+
DEFLECTION ANGLE(DEG.)	10-20	5	6	8	10
	20-30	10	12	16	20
	30-40	15	18	24	30
	40+	20	24	32	40

SLOPE ROUNDING REQUIRED FOR THE SIDES OF CUT SLOPES AS WELL TOP OF CUT SLOPES.

NOTES:

1. USE THE CURRENT EDITION OF AASHTO A POLICY ON GEOMETRIC DESIGN OF HIGHWAYS AND STREETS FOR DESIGN OF ROADWAY ELEMENTS.
2. USE THE CURRENT EDITION OF AASHTO ROADSIDE DESIGN GUIDE FOR CLEAR ZONE REQUIREMENTS. CLEAR ZONE MAY EXTEND INTO CUT OR FILL SLOPES.
3. STANDARDS SHOWN ARE RECOMMENDED VALUES. EXCEED STANDARDS IF CONDTIONS PERMIT.
4. TRANSITION FROM FLAT TO STEEPER CUT AND FILL SLOPES IN SUFFICIENT DISTANCE TO PROVIDE A NATURAL PLEASING APPEARANCE.
5. INSTALL SURFACE DITCH WHEN SURFACE DRAINAGE IS TOWARDS CUT. SURFACE DITCH MUST DRAIN TO NATURAL DRAINAGE OR TO ROADSIDE DITCH.
6. PAVEMENT THICKNESS CONSISTS OF UTBC AND HARD SURFACING ONLY.

REVISIONS

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UTAH DEPARTMENT OF TRANSPORTATION
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CHAIRMAN STANDARDS COMMITTEE APPROVED — AUG. 28, 2003 DATE

DEPUTY DIRECTOR

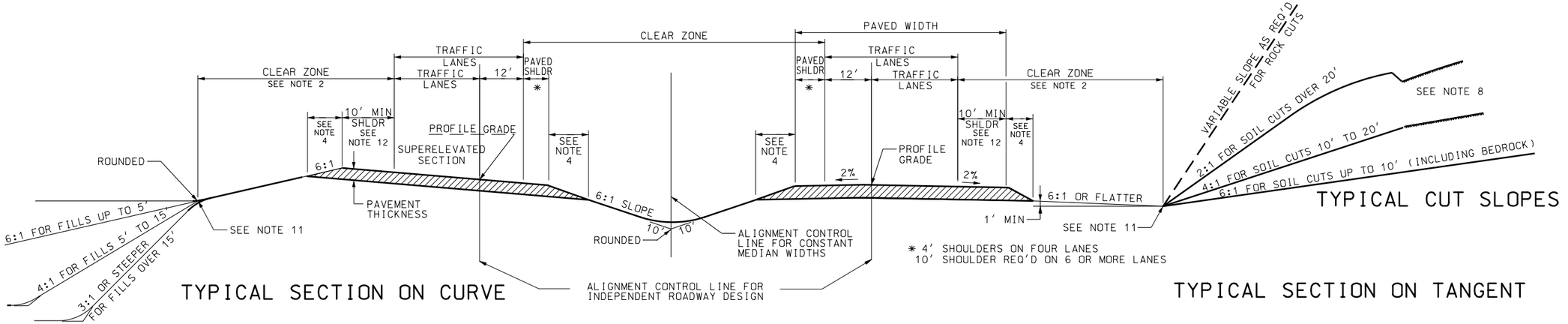
SLOPE ROUNDING, BENCHED SLOPE, AND CUT DITCH DETAILS

STANDARD DRAWING TITLE

STD DWG
DD 2

DGN File:N:\Esd\Standard_Drawings\Imperial\Approved\Changes&Approved\dd02.dgn
17-SEP-2003

MULTI-LANE

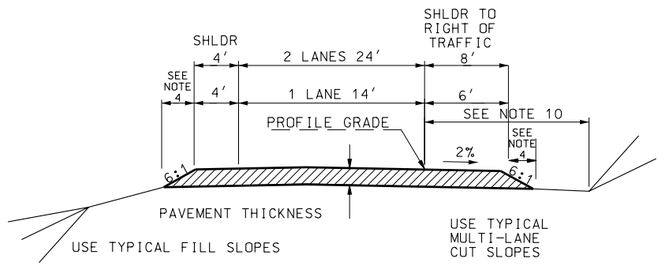


TYPICAL SECTION ON CURVE

TYPICAL SECTION ON TANGENT

TYPICAL FILL SLOPES

TYPICAL CUT SLOPES



TYPICAL RAMP

NOTES:

1. USE THE CURRENT EDITION OF AASHTO A POLICY ON GEOMETRIC DESIGN OF HIGHWAYS AND STREETS FOR DESIGN OF ROADWAY ELEMENTS.
2. USE THE CURRENT EDITION OF AASHTO ROADSIDE DESIGN GUIDE FOR CLEAR ZONE REQUIREMENTS. CLEAR ZONE MAY INCLUDE CUT OR FILL SLOPES.
3. STANDARDS SHOWN ARE RECOMMENDED VALUES. EXCEED STANDARDS IF CONDTIONS PERMIT.
4. MAINTAIN A CONSTANT WIDTH TO THE NEAREST 1/2 FOOT AND PROVIDE A SLOPE OF 6:1 OR FLATTER IN A NORMAL SECTION WITH A 2% SLOPE.

   PROVIDE A SLOPE OF 6:1 OR FLATTER UNDER CONDITIONS OF SUPER ELEVATION.
5. PROVIDE BACKSLOPE ROUNDING FOR ALL CUTS STEEPER THAN 4:1 AS PER ROUNDING DETAIL, STD DWG DD 2.
6. TRANSITION FROM FLAT TO STEEPER CUT AND FILL SLOPES IN SUFFICIENT DISTANCE TO PROVIDE A NATURAL PLEASING APPEARANCE.
7. PAVEMENT THICKNESS CONSISTS OF UTBC AND HARD SURFACING ONLY.
8. INSTALL SURFACE DITCH WHEN SURFACE DRAINAGE IS TOWARDS CUT. SURFACE DITCH MUST DRAIN TO NATURAL DRAINAGE OR ROADSIDE DITCH.
9. SEE STD DWG DD 2 FOR TYPICAL SECTION ON DITCH FLARING AND BENCHED SLOPE.
10. DESIGN SPEED CHANGES THROUGHOUT LENGTH OF RAMP. USE APPLICABLE CLEAR ZONE.
11. USE A MINIMUM 30′ HINGE POINT TO BE MAINTAINED FROM EDGE OF TRAFFIC LANE.
12. USE A 12′ MINIMUM OUTSIDE SHOULDER WHEN HEAVY TRUCK TRAFFIC EXCEEDS 250 DDHV.
13. RANGE OF SUPERELEVATION IS THE PAVED WIDTH.

REVISIONS

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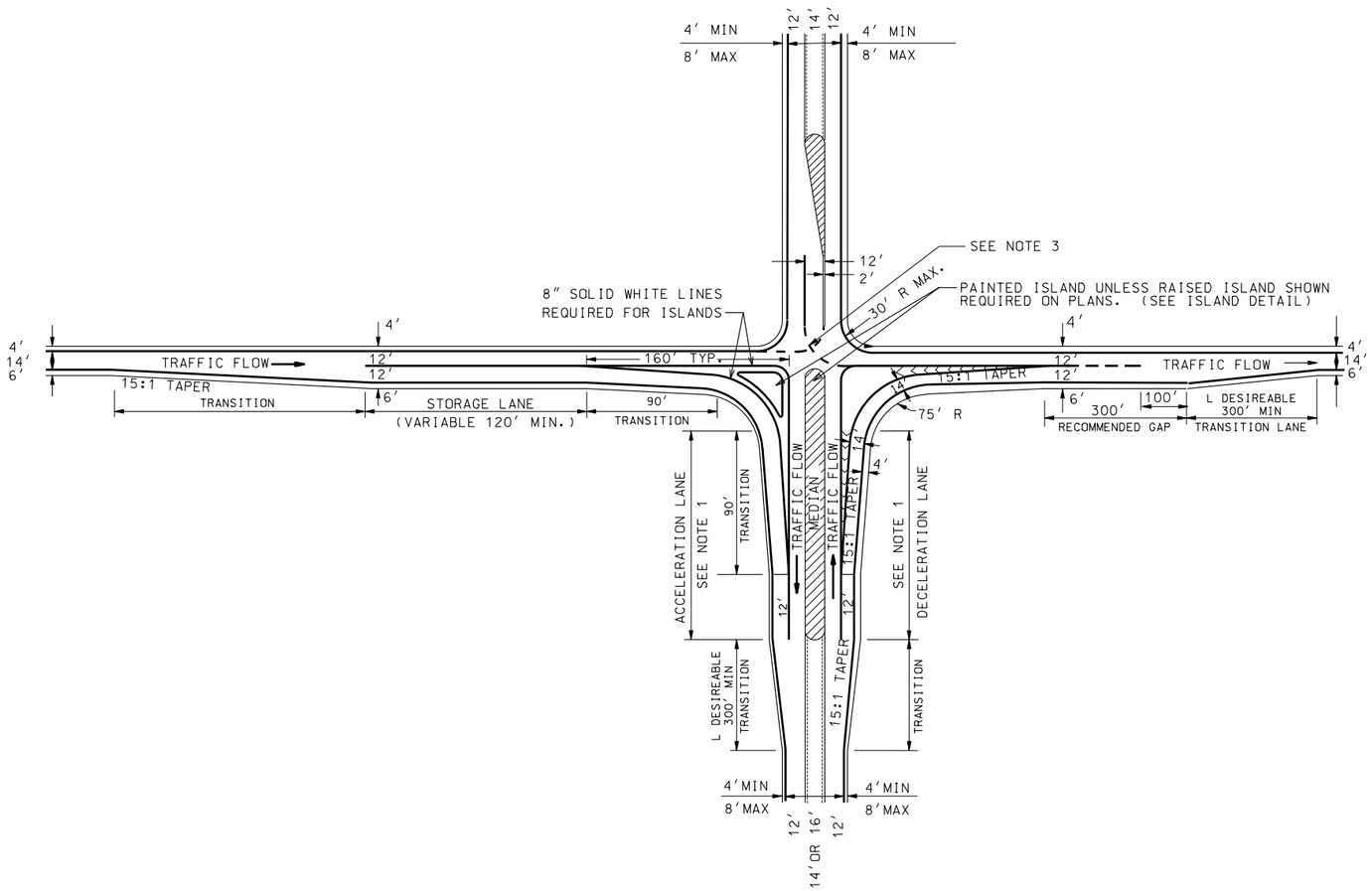
CHAIRMAN STANDARDS COMMITTEE APPROVED — AUG. 28, 2003 DATE

DEPUTY DIRECTOR

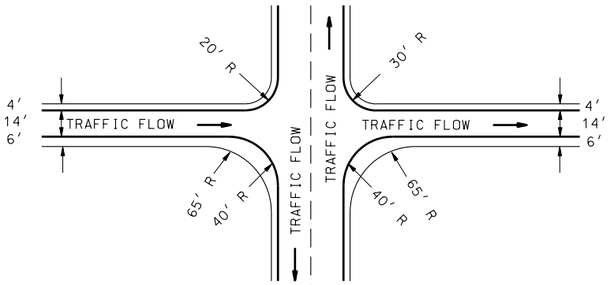
GEOMETRIC DESIGN FOR FREEWAYS (ROADWAY)

STANDARD DRAWING TITLE

STD DWG
DD 4



TYPE "A"



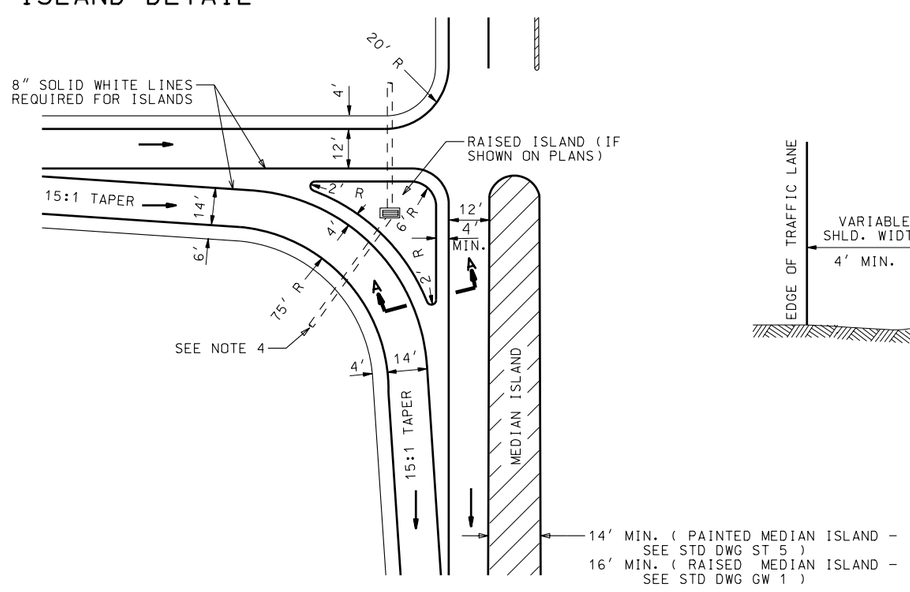
TYPE "B"

NOTE: TYPE "B" TO BE USED IN AREAS
WITH LESS THAN 400 D.H.V.

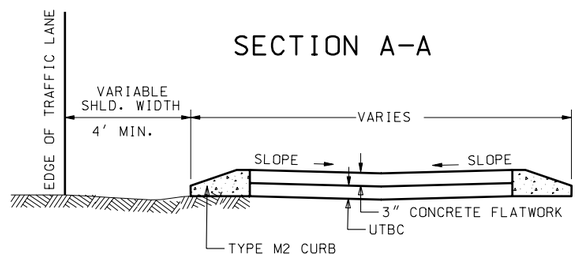
TABLE I	
SPEED	**FORMULA**
FOR SPEEDS OF 40 MPH AND LESS	$L = \frac{WS^2}{60}$
FOR SPEEDS OF 45 MPH AND GREATER	$L = WS$

WHERE:
L = TAPER LENGTH IN FEET
W = WIDTH OF OFFSET IN FEET
S = SPEED IN MPH

ISLAND DETAIL



SECTION A-A



NOTES:

1. USE CURRENT EDITION OF THE AASHTO A POLICY ON GEOMETRIC DESIGN OF HIGHWAYS AND STREETS FOR DESIGN OF ROADWAY ELEMENTS
2. USE CURRENT EDITION OF THE AASHTO ROADSIDE DESIGN GUIDE FOR CLEAR ZONE REQUIREMENTS
3. USE WB-50 FOR TURNING RADIUS FOR LEFT TURNS
4. PROVIDE DRAINAGE FROM CATCH BASIN IN RAISED ISLAND AREA

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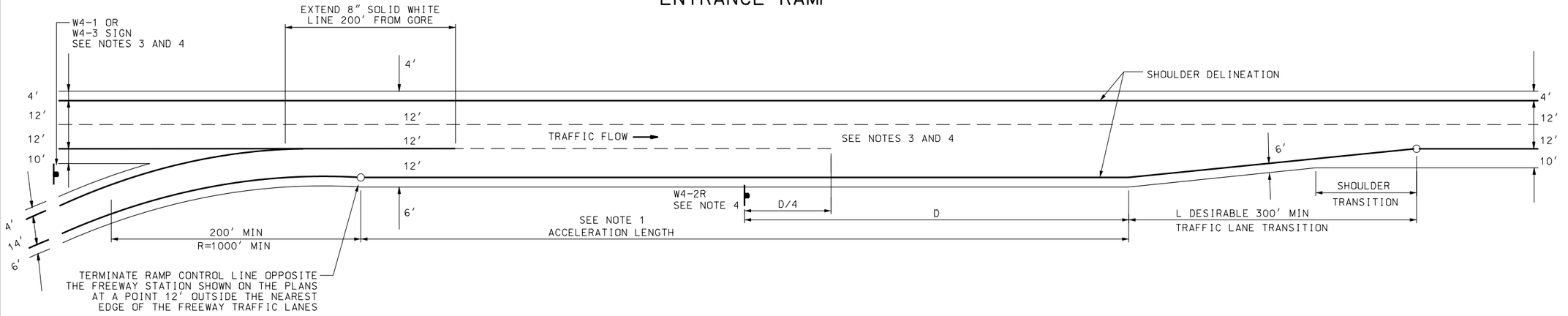
DEPUTY DIRECTOR

ENTRANCE AND EXIT RAMPS AT CROSSROADS

STANDARD DRAWING TITLE

STD DWG
DD 5

ENTRANCE RAMP



EXIT RAMP

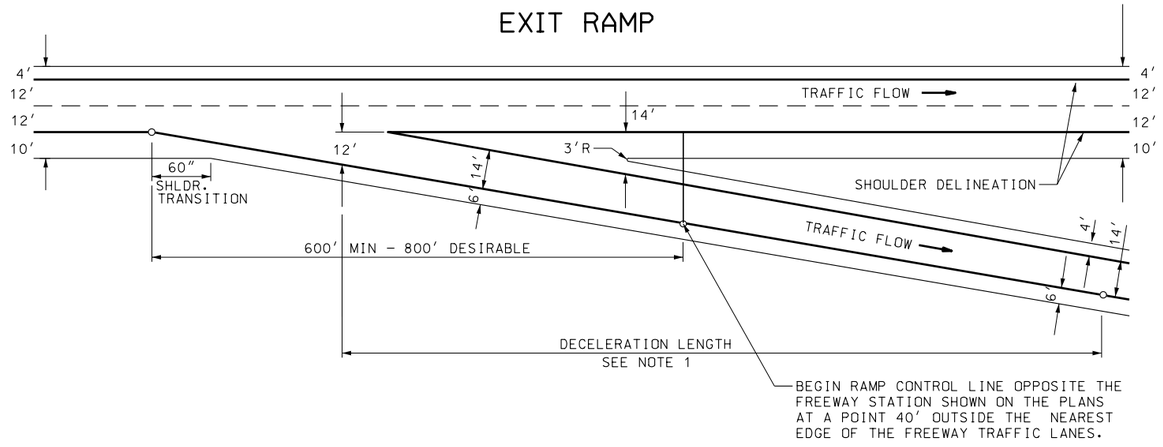


TABLE I		
SPEED MPH	L* FT	D FT
45	540	550
50	600	625
55	660	700
60	720	775
65	780	850
70	840	925
75	900	1000

* BASED ON 12' TRAFFIC LANE WIDTH

NOTES:

1. USE CURRENT EDITION OF THE AASHTO A POLICY ON GEOMETRIC DESIGN OF HIGHWAYS AND STREETS FOR DESIGN OF ROADWAY ELEMENTS.
2. USE CURRENT EDITION OF THE AASHTO ROADSIDE DESIGN GUIDE FOR CLEAR ZONE REQUIREMENTS.
3. USE MERGE SIGN (W4-1) WHEN TANGENT RAMP LENGTH IS EQUAL TO AASHTO ACCELERATION LENGTH.

   PLACE BROKEN LINE TO THE HALFWAY POINT OF THE AASHTO ACCELERATION LENGTH WHEN USING THE W4-1 SIGN.

   DO NOT USE LANE ENDS SIGN (W4-2) WHEN USING THE W4-1 SIGN.
4. USE ADDED LANE SIGN (W4-3) WHEN TANGENT RAMP LENGTH EXCEEDS THE AASHTO ACCELERATION LENGTH.

   PLACE BROKEN LINE AND DOTTED LINE AS PER STD DWG ST 3 WHEN USING THE W4-3 SIGN.

   PLACE LANE ENDS SIGN (W4-2) ONLY WHEN USING THE W4-3 SIGN.
5. SEE STD DWG ST 3 FOR PAVEMENT MARKINGS.

REVISIONS

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DEPUTY DIRECTOR

ENTRANCE AND EXIT RAMP GEOMETRICS

STANDARD DRAWING TITLE

STD DWG
DD 6

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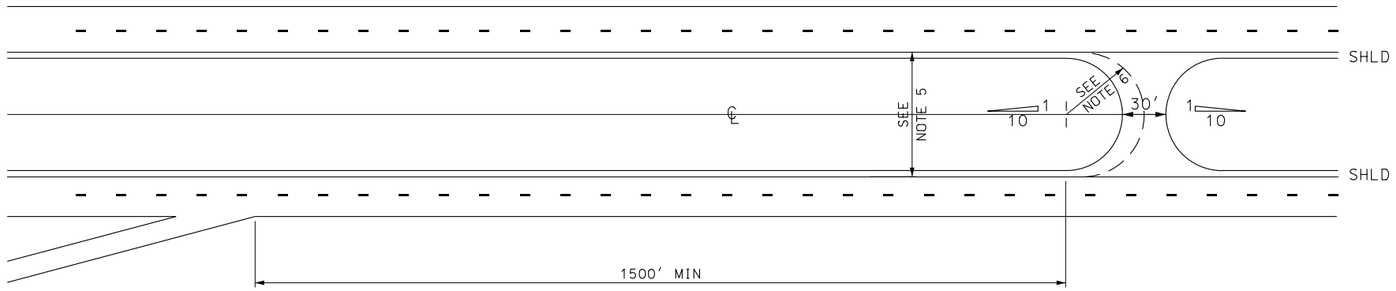
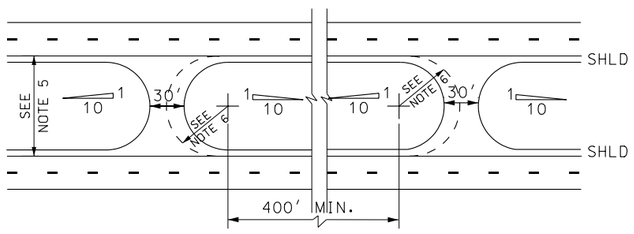
17-SEP-2003



SINGLE CROSSOVER



DOUBLE CROSSOVER
SEE NOTE 13

NOTE:

1. USE CURRENT EDITION OF AASHTO A POLICY ON GEOMETRIC DESIGN OF HIGHWAYS AND STREETS FOR DESIGN OF ROADWAY ELEMENTS
2. USE CURRENT EDITION OF AASHTO ROADSIDE DESIGN GUIDE FOR CLEAR ZONE REQUIREMENTS
3. PLACE CROSSOVER A MINIMUM OF 1500 FEET FROM RAMPS
4. SPACE CROSSOVERS A MINIMUM OF $2\frac{1}{2}$ MILES APART
5. USE CROSSOVERS WHERE MEDIAN WIDTH IS 36 FEET OR GREATER. REGION TRAFFIC ENGINEER APPROVAL REQUIRED FOR MEDIAN WIDTHS LESS THAN 36 FEET.
6. USE $\frac{1}{2}$ MEDIAN WIDTH AS CROSSOVER RADIUS, EXCEPT FOR MEDIANS WIDER THAN 130 FEET, THEN USE 65 FEET RADIUS MAXIMUM WITH CONNECTING TANGENT SECTION.
7. USE MINIMUM 10:1 SLOPE FOR APPROACHES TO CROSSOVER.
8. PROVIDE MINIMUM SIGHT DISTANCE FOR CROSSOVER LOCATIONS.
9. PLACE 'NO U-TURN-EXCEPT AUTHORIZED VEHICLES' SIGNING AND DELINEATION AT EACH CROSSOVER AS PER STD DWG ST 2.
10. CONSTRUCT THE MEDIAN CROSSOVER TO APPEAR INCONSPICUOUS BY FLATTENING OF SLOPES AND USING ROAD BASE OR SIMILAR MATERIAL FOR SURFACING.
11. PROVIDE MAINTENANCE CROSSOVERS AT LOCATIONS WHERE SNOW AND ICE REMOVAL WOULD BE SIGNIFICANTLY FACILITATED. LOCATIONS TO BE DETERMINED BY THE REGION TRAFFIC ENGINEER.
12. PROVIDE EMERGENCY VEHICLE CROSSOVERS OF THE TYPES SHOWN ON PLANS. LOCATIONS TO BE DETERMINED BY THE REGION TRAFFIC ENGINEER.
13. INSTALL DOUBLE CROSSOVERS AT MAINTENANCE STATION AREA BOUNDARIES. LOCATIONS TO BE DETERMINED BY THE REGION TRAFFIC ENGINEER.

REVISIONS

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CHAIRMAN STANDARDS COMMITTEE APPROVED — AUG.28.2003 DATE

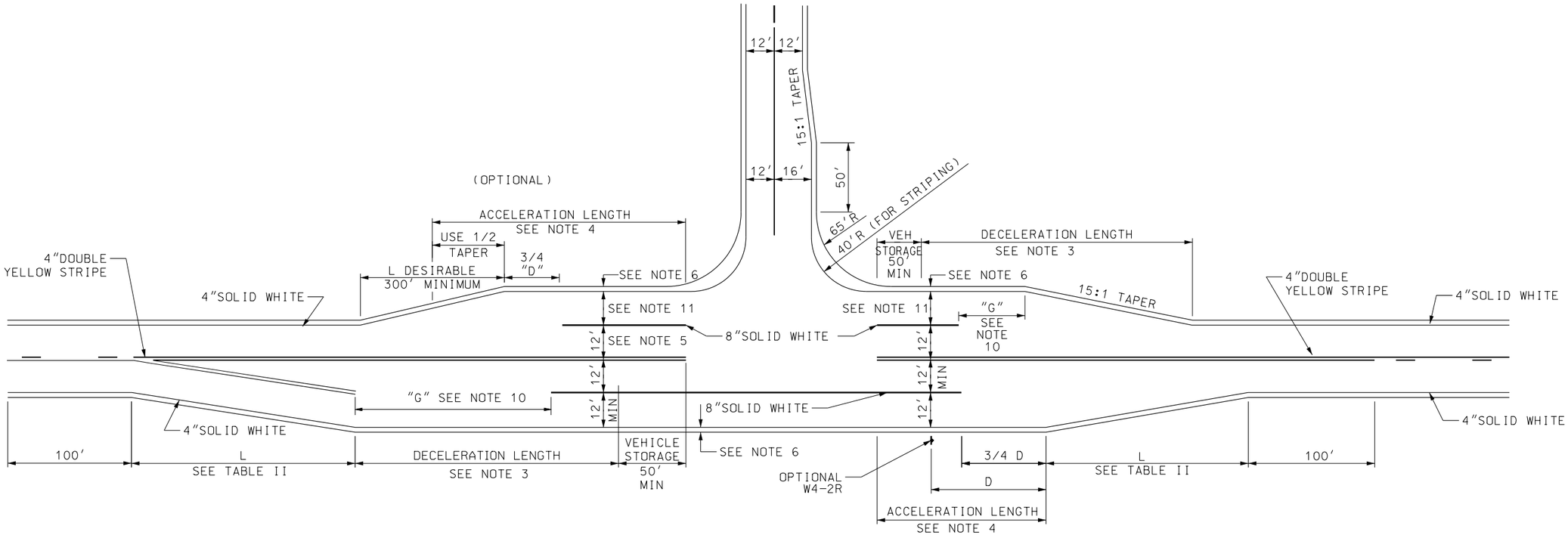
DEPUTY DIRECTOR

FREEWAY CROSSOVER

STANDARD DRAWING TITLE

STD DWG
DD 7

DGN File:N:\Esd\Standard_Drawings\Imperial\Approved\Changes&Approved\dd07.dgn
17-SEP-2003



NOTES:

1. USE CURRENT EDITION OF THE AASHTO A POLICY ON GEOMETRIC DESIGN OF HIGHWAYS AND STREETS FOR DESIGN OF ROADWAY ELEMENTS.
2. USE CURRENT EDITION OF THE AASHTO ROADSIDE DESIGN GUIDE FOR CLEAR ZONE REQUIREMENTS.
3. FOR DECELERATION LENGTH:

   USE A RUNNING SPEED OF 10 MPH BELOW POSTED SPEED LIMIT FOR ENTRANCE SPEED.

   ADJUST FOR SPEED CHANGES ON GRADES AS NECESSARY.
4. FOR ACCELERATION LENGTH:

   USE A RUNNING SPEED OF 10 MPH BELOW POSTED SPEED LIMIT FOR MERGING SPEED.

   ADJUST FOR SPEED CHANGES ON GRADES AS NECESSARY.
5. USE A 16 FEET MINIMUM ACCEPTANCE LANE FOR 50 FEET WITH A 15:1 TAPER IF ACCELERATION LANE IS NOT USED.
6. USE 4 FEET MINIMUM SHOULDER FOR RIGHT TURN DECELERATION LANE TAPER, RIGHT TURN STORAGE LANE, RIGHT TURN ACCELERATION LANE, AND RIGHT TURN ACCELERATION LANE TAPER. MATCH EXISTING WIDTH OF SHOULDER, WITH A 4 FEET MINIMUM, AT ALL OTHER SHOULDER LOCATIONS.
7. STANDARDS SHOWN ARE RECOMMENDED VALUES. EXCEED STANDARDS IF CONDITIONS PERMIT.
8. PROVIDE LEFT TURN POCKET ON OPPOSITE APPROACH FOR A FOUR LEG INTERSECTION.
9. PROVIDE LEFT TURN LANE, RIGHT TURN DECELERATION LANE, RIGHT TURN ACCELERATION LANE, AND/OR LEFT TURN ACCELERATION LANE WHEN VOLUMES EXCEED THOSE LISTED IN TABLE I. INCREASE THE VOLUMES TO PROVIDE PASSENGER CAR EQUIVALENTS FOR TRUCKS.
10. G = 90′ FOR SPEEDS 40 MPH AND BELOW
    G = 140′ FOR SPEEDS 45 TO 50 MPH
    G = 180′ FOR SPEEDS 55 MPH AND ABOVE
11. 12′ LANE WIDTH DESIRABLE
    10′ MINIMUM LOW VOLUME LOW SPEED.
12. SEE STD DWG ST 5 FOR INFORMATION ON SIGNING AND STRIPING DETAILS.

TABLE I

MINIMUM LEVELS FOR INSTALLATION OF TURN AND ACCELERATION LANES ON RURAL TWO LANE ROADS

SPEED	LEFT TURN LANE	RIGHT TURN LANE	RIGHT TURN ACCELERATION LANE	LEFT TURN ACCELERATION LANE
40 MPH AND LESS	25 VPH	50 VPH	OPTIONAL	OPTIONAL
45 TO 55 MPH	10 VPH	25 VPH	50 VPH	**
60 MPH AND GREATER	REQ'D*	10 VPH	25 VPH	***

* FARM ACCESSES EXCLUDED.
** OPTIONAL FOR 50 MPH AND LESS. FOR 55 MPH, AS REQUIRED BY THE REGION TRAFFIC ENGINEER.
*** AS REQUIRED BY THE REGION TRAFFIC ENGINEER.
VPH= VEHICLES PER HOUR IN ANY ONE HOUR PERIOD IN PASSENGER CAR EQUIVALENTS.

TABLE II

SPEED	FORMULA
FOR SPEEDS OF 40 MPH AND LESS	$L = \frac{WS^2}{60}$
FOR SPEEDS OF 45 MPH AND GREATER	L= WS

WHERE:
L = TAPER LENGTH IN FEET
W = WIDTH OF OFFSET IN FEET
S = SPEED IN MPH

"D" DISTANCE

SPEED MPH	"D" FEET	3/4 "D" FEET
25	250	190
30	325	245
35	400	300
40	475	360
45	550	415
50	625	470
55	700	525
60	775	585
65	850	640

REVISIONS

NO.	DATE	APPR.	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
STANDARD DRAWINGS FOR ROAD AND BRIDGE CONSTRUCTION
SALT LAKE CITY, UTAH

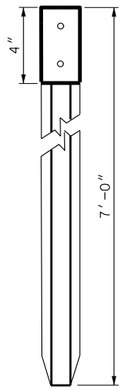
RECOMMENDED FOR APPROVAL — AUG.28,2003 DATE
CHAIRMAN STANDARDS COMMITTEE APPROVED — AUG.28,2003 DATE
DEPUTY DIRECTOR

TYPICAL RURAL 2 LANE ROAD WITH MEDIAN LANE AND DECELERATION LANE FOR INTERSECTING CROSSROADS

STANDARD DRAWING TITLE

STD DWG
DD 14

DGN File:N:\Esd\Standard_Drawings\Imperial\Approved\Changes\Approved\dd14.dgn
17-SEP-2003

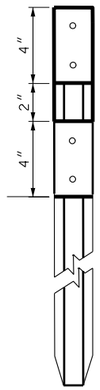


TYPE I

SINGLE UNIT

(OF COLOR SPECIFIED)

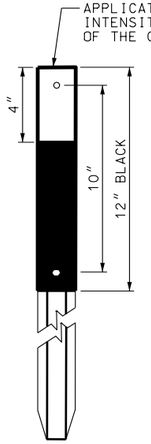
SEE NOTE 1



TYPE II

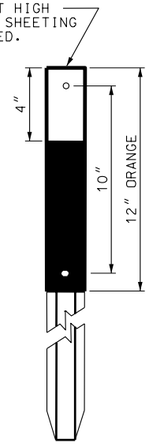
DOUBLE UNIT

SEE NOTE 1



CULVERT MARKER

SEE NOTE 2



MAINTENANCE MARKER

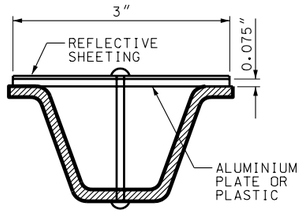
SEE NOTE 2

FREEWAY CROSSOVER MARKER

SEE NOTE 9

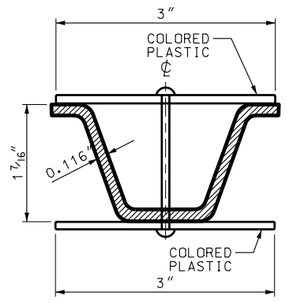
NOTES:

1. USE GALVANIZED STEEL POSTS FABRICATED WITH $^{5}/_{16}$″ HOLES ON 1″ SPACING. PUNCH HOLES ON THE CENTERLINE OF THE POST. PLACE TOP HOLE 1″ FROM THE TOP OF POST. PUNCH HOLES THE FULL LENGTH OF THE POST.
2. PAINT THE SPECIFIED COLOR OR ATTACH 3″ X 12″ X 1/10″ COLORED PLASTIC ON CULVERT AND MAINTENANCE MARKERS. USE BLACK ABOVE ORANGE WHEN BOTH MARKERS (MAINTENANCE AND CULVERT) ARE REQUIRED ON ONE DELINEATOR.
3. MOUNT BARRIER REFLECTORS ON CONCRETE AND BRIDGE PARAPETS WITH TWO $^{1}/_{4}$″ X $^{1}/_{4}$″ METAL HIT ANCHORS.
4. MOUNT BARRIER REFLECTORS ON CONCRETE BARRIER AS SHOWN ON STD DWG BA 2A.
5. MOUNT STRAIGHT REFLECTORS ON WOOD POSTS WITH TWO $2^{1}/_{2}$″ ELECTRO GALVANIZED RING SHANK NAILS WITH NEOPRENE WASHERS.
6. MOUNT STRAIGHT REFLECTORS ON STEEL POSTS WITH TWO $^{1}/_{4}$″ X $^{3}/_{4}$″ BOLTS AND SELF LOCKING NUTS.
7. MOUNT BARRIER REFLECTORS ON GUARDRAIL POSTS AS SHOWN ON STD DWG BA 4A.
8. INSTALL DELINEATOR PLATE ON THE SIDE OF THE POST FACING TRAFFIC. PREFERRED ORIENTATION OF POST TO ONCOMING TRAFFIC IS AS SHOWN. HOWEVER, EXISTING POST WITH THE OPPOSITE ORIENTATION IS ACCEPTABLE. INSTALL ON OPEN FACE SIDE WITH TWO $^{1}/_{4}$″ DIAMETER EXPANSION RIVETS (GRIP RANGE $1^{3}/_{8}$″ TO $1^{5}/_{8}$″). INSTALL ON OPPOSITE SIDE WITH TWO $^{1}/_{4}$″ POP RIVETS WITH BACKING WASHERS.
9. REFER TO STD DWG ST 2 FOR FREEWAY CROSSOVER DELINEATION MARKINGS AND HARDWARE.



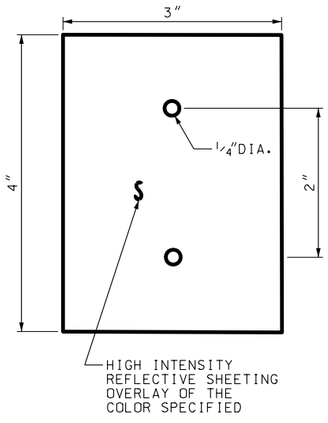
DELINEATOR INSTALLATION

SEE NOTE 8



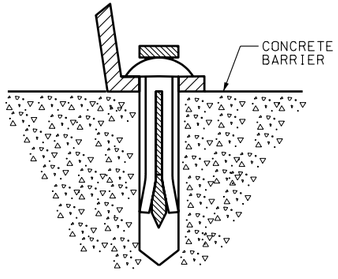
CULVERT/MAINTENANCE MARKER INSTALLATION

FOR 2 LB/FT POST WITH COLORED PLASTIC ATTACHED. SEE NOTE 2.



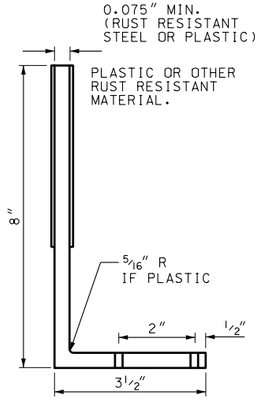
DELINEATOR PLATE

SEE NOTE 8

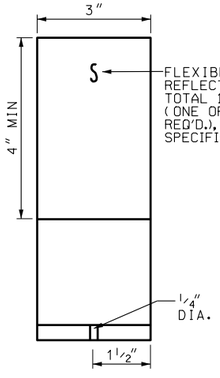


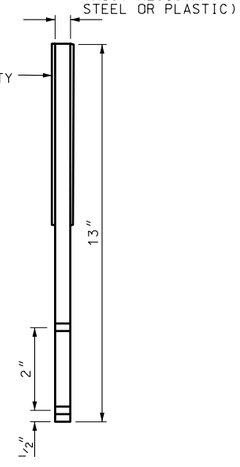
METAL HIT ANCHORS

SEE NOTE 3



"L" REFLECTOR

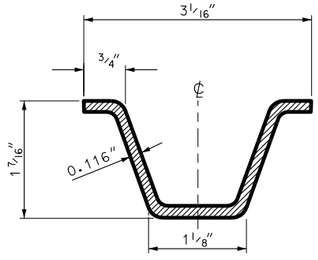




BARRIER REFLECTORS

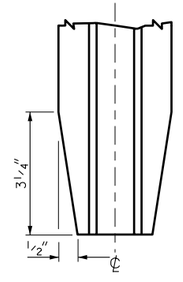
SEE NOTES 3, 4, 5, 6, 7

STRAIGHT REFLECTOR



CROSS SECTION

FOR 2 LB/FT POST



POST TAPER DETAIL

REVISIONS

NO.	DATE	APPR.	REMARKS
1	08/14/03	J.L.	CORRECTED NAME OF FREEWAY CROSSOWER MARKER

UTAH DEPARTMENT OF TRANSPORTATION

STANDARD DRAWINGS FOR ROAD AND BRIDGE CONSTRUCTION

SALT LAKE CITY, UTAH

RECOMMENDED FOR APPROVAL — AUG.28.2003 DATE

CHAIRMAN STANDARDS COMMITTEE APPROVED — AUG.28.2003 DATE

DEPUTY DIRECTOR

DELINEATION HARDWARE

STANDARD DRAWING TITLE

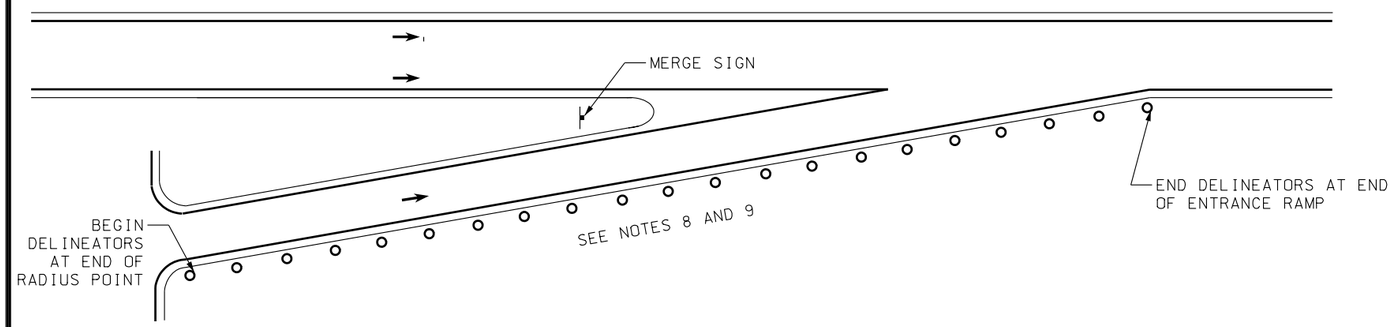
STD DWG

GW 9

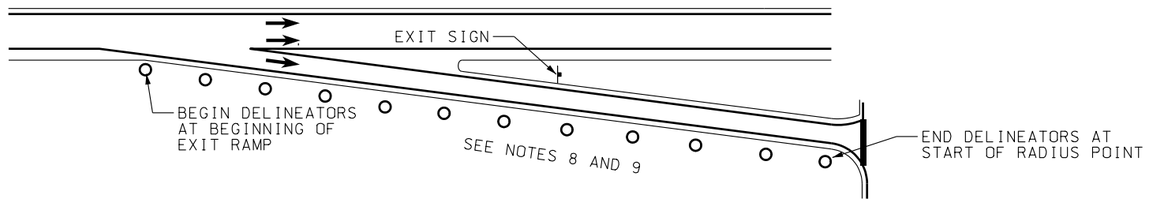
DGN File:N:\Esd\Standard Drawings\Imperial\Approved\Changes\Approved\gw09.dgn

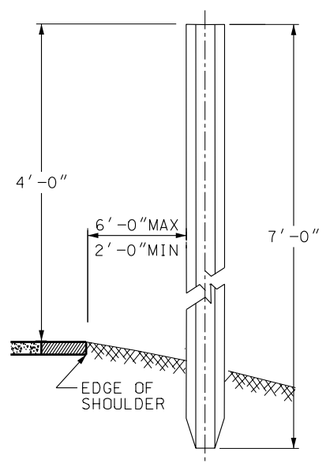
17-SEP-2003

ENTRANCE RAMP

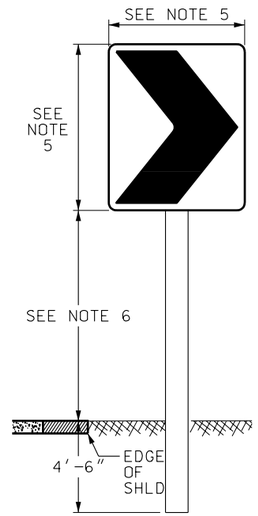


EXIT RAMP

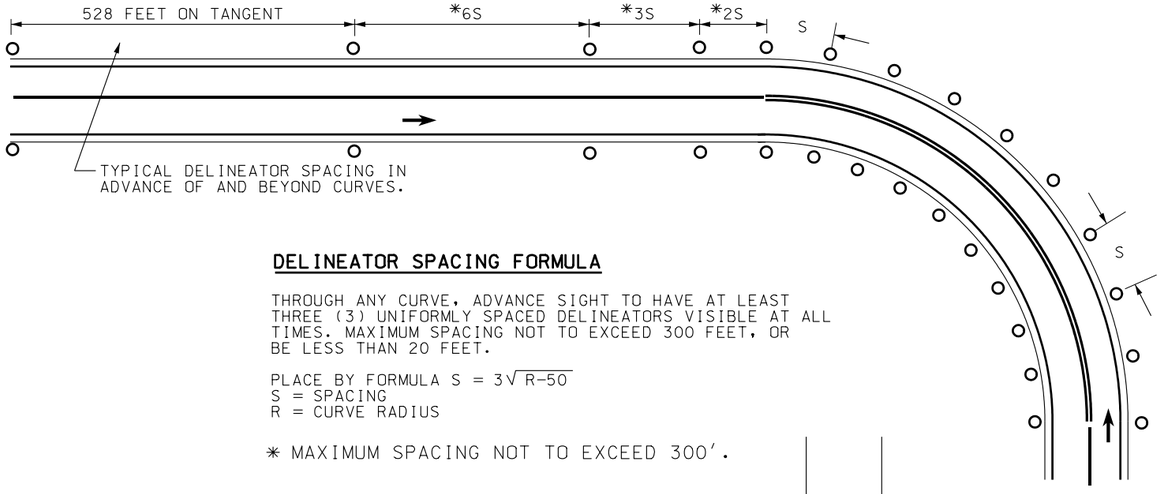




DELINEATOR



CHEVRON ALIGNMENT SIGN

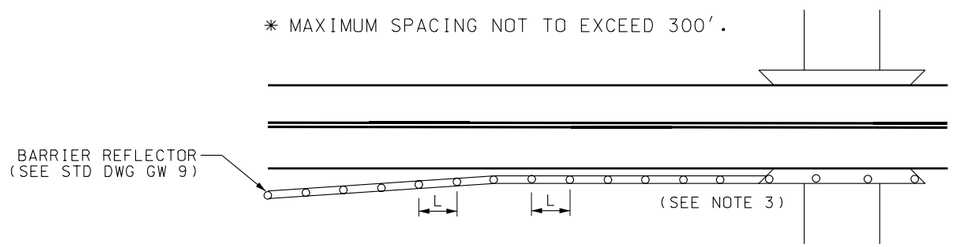


DELINEATOR SPACING FORMULA

THROUGH ANY CURVE, ADVANCE SIGHT TO HAVE AT LEAST THREE (3) UNIFORMLY SPACED DELINEATORS VISIBLE AT ALL TIMES. MAXIMUM SPACING NOT TO EXCEED 300 FEET, OR BE LESS THAN 20 FEET.

PLACE BY FORMULA $S = 3\sqrt{R-50}$
S = SPACING
R = CURVE RADIUS

* MAXIMUM SPACING NOT TO EXCEED 300'.



BARRIER REFLECTOR DETAIL
(SEE NOTE 2)

NOTES:

1. BARRIERS ARE DEFINED AS BEING GUARDRAIL, CONCRETE BARRIER & BRIDGE PARAPET WALL.
2. MOUNT BARRIER REFLECTORS ON ENTIRE LENGTH OF BARRIER AS PER BARRIER TYPE STANDARD.

   USE REFLECTOR SPACING (L) OF 100 FEET IN PERMANENT LOCATIONS, AND 50 FEET FOR TEMPORARY SITUATIONS.

   USE REFLECTOR COLOR TO MATCH THE ADJACENT PAINT STRIPE.
3. IF GUARDRAIL IS NOT ATTACHED TO PARRAPET, INSTALL APPROPRIATE OBJECT MARKER OM-3R (OR L OR C) IN PLACE OF DELINEATOR AT LEADING EDGE OF BRIDGE PARAPET.
4. CHEVRON ALIGNMENT (W1-8) SIGNS MAY BE USED WHEN ADDITIONAL EMPHASIS AND GUIDANCE FOR A CHANGE IN HORIZONTAL ALIGNMENT IS NEEDED. THE W1-8 SIGN MAY BE USED TO SUPPLEMENT STANDARD DELINEATORS ON CURVES. THE W1-8 SIGN MAY BE USED TO SUPPLEMENT OR AS AN ALTERNATE TO THE LARGE ARROW (W1-6) SIGN.

   WHEN USED, INSTALL THE W1-8 SIGNS ON THE OUTSIDE OF A TURN OR CURVE, IN LINE WITH, AND AT APPROXIMATELY A RIGHT ANGLE TO APPROACHING TRAFFIC.

   THE W1-8 SIGN SHOULD BE VISIBLE FOR A SUFFICIENT DISTANCE TO PROVIDE THE ROAD USER WITH ADEQUATE TIME TO REACT TO THE CHANGE IN ALIGNMENT. SPACE THE SIGNS SUCH THAT THE ROAD USER ALWAYS HAS AT LEAST TWO SIGNS IN THEIR VIEW UNTIL THE CHANGE OF ALIGNMENT ELIMINATES THE NEED FOR A SIGN.
5. USE W1-8 SIGN SIZE AS FOLLOWS:

   a) FOR CONVENTIONAL ROADS USE 24" X 30".
   b) FOR EXPRESSWAYS USE 30"X 36".
   c) FOR FREEWAYS USE 36" X 48".
6. USE 7' MIN, 7'6" MAX MOUNTING HEIGHT ON INTERSTATE, EXPRESSWAY, AND URBAN AREAS. USE 5' MIN, 7'6" MAX IN RURAL AREAS.
7. USE CONSISTENT MOUNTING HEIGHT AT EACH LOCATION.
8. USE TYPE II DELINEATORS AT 300 FEET SPACING ON TANGENTS ALONG ALL ENTRANCE AND EXIT RAMPS AS SHOWN. USE DELINEATOR SPACING FORMULA FOR ALL RAMP CURVES. RAMP DELINEATORS ARE NOT REQUIRED WHERE CONTINUOUS LIGHTING IS IN OPERATION.
9. USE DELINEATORS ON THE LEFT SIDE OF ENTRANCE AND EXIT RAMPS FOR RIGHT HAND CURVES UPON APPROVAL OF THE REGION TRAFFIC ENGINEER.

REVISIONS

NO.	DATE	APPR.	REMARKS
1	08/28/03	J.L.	REVISED ENTIRE DRAWING

UTAH DEPARTMENT OF TRANSPORTATION
STANDARD DRAWINGS FOR ROAD AND BRIDGE CONSTRUCTION
SALT LAKE CITY, UTAH

RECOMMENDED FOR APPROVAL — FEB.27, 2003 DATE

CHAIRMAN STANDARDS COMMITTEE APPROVED — FEB.27, 2003 DATE

DEPUTY DIRECTOR

DELINEATION APPLICATION

STANDARD DRAWING TITLE

STD DWG
GW 10

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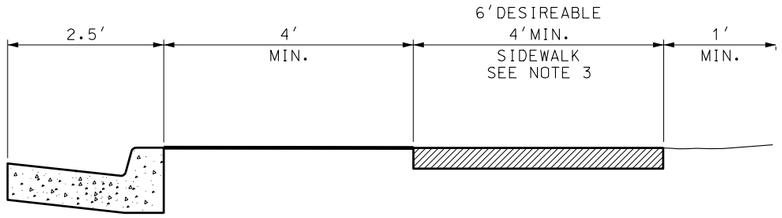
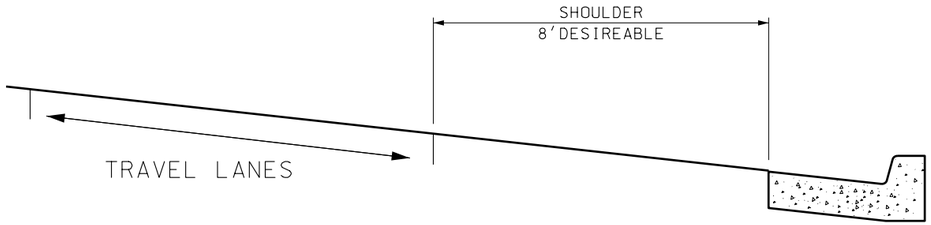
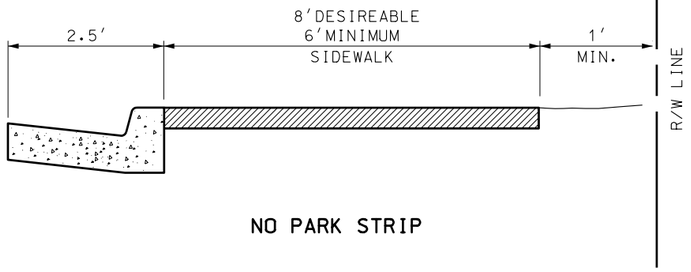
22-SEP-2003



PARK STRIP



URBAN ROADWAY SHOULDERS



NO PARK STRIP

NOTES:

1. USE CURRENT EDITION OF THE AASHTO A POLICY ON GEOMETRIC DESIGN OF HIGHWAYS AND STREETS FOR DESIGN OF ROADWAY ELEMENTS
2. USE CURRENT EDITION OF THE AASHTO ROADSIDE DESIGN GUIDE FOR CLEAR ZONE REQUIREMENTS
3. PROVIDE A 60 INCH x 60 INCH PASSING AREA ON SIDEWALKS OF LESS THAN 60 INCH WHEN THERE IS NOT A HARD SURFACE PASSING AREA OF 60 INCH MINIMUM WIDTH IN A 200 FOOT SEGMENT

REVISIONS

NO.	DATE	APPR.	REMARKS
1	08/14/03	J.L.	NEW DRAWING

UTAH DEPARTMENT OF TRANSPORTATION
STANDARD DRAWINGS FOR ROAD AND BRIDGE CONSTRUCTION
SALT LAKE CITY, UTAH

RECOMMENDED FOR APPROVAL — AUG.28,2003 DATE

CHAIRMAN STANDARDS COMMITTEE APPROVED — AUG.28,2003 DATE

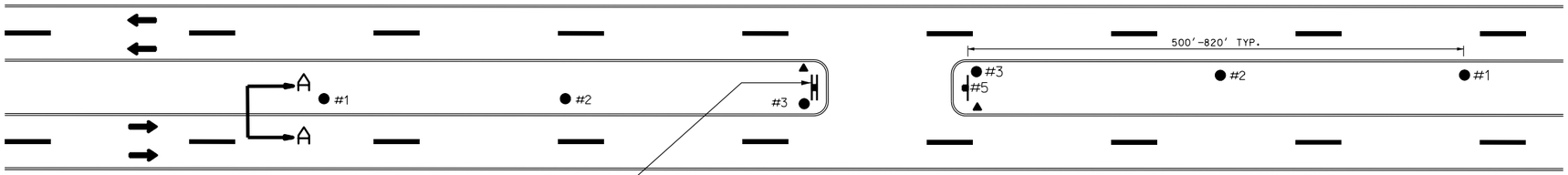
DEPUTY DIRECTOR

SIDEWALKS AND SHOULDERS ON URBAN ROADWAYS

STANDARD DRAWING TITLE

STD DWG
GW 11

DGN File:N:\Esd\Standard_Drawings\Imperial\Approved\Changes&Approved\gw11.dgn
23-SEP-2003



FREEWAY CROSSOVER

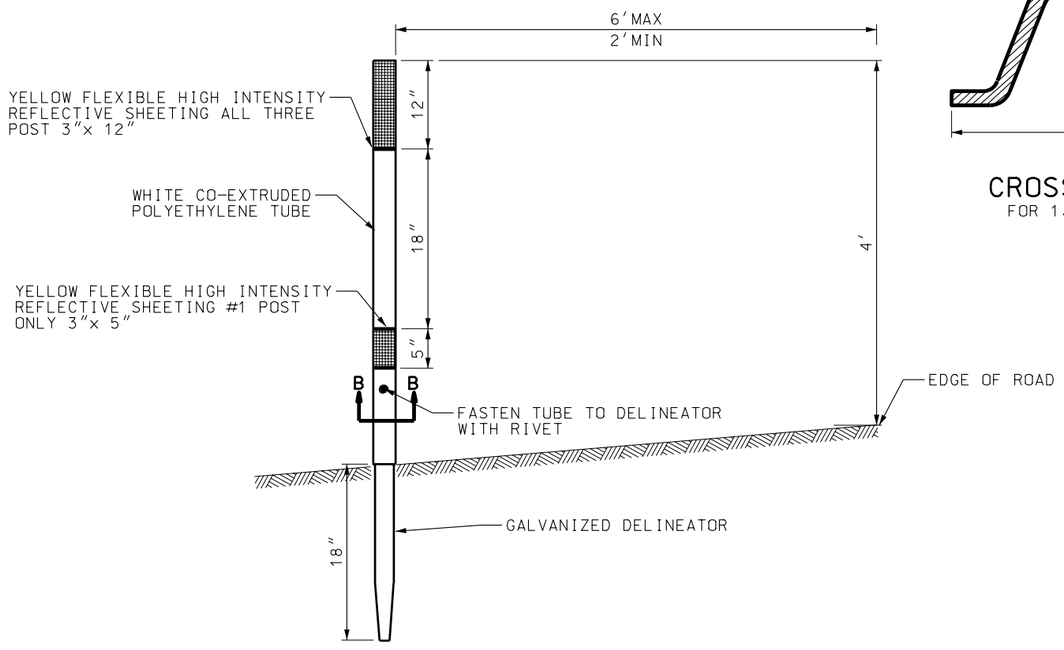
LEGEND

● = WHITE FLEXIBLE GUIDE POST

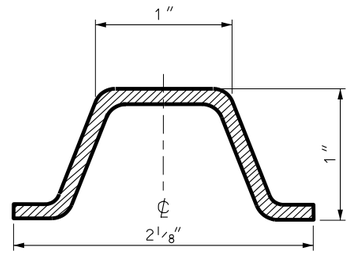
▲ = TYPE II DELINEATOR

30" X 48" BLK.R/W

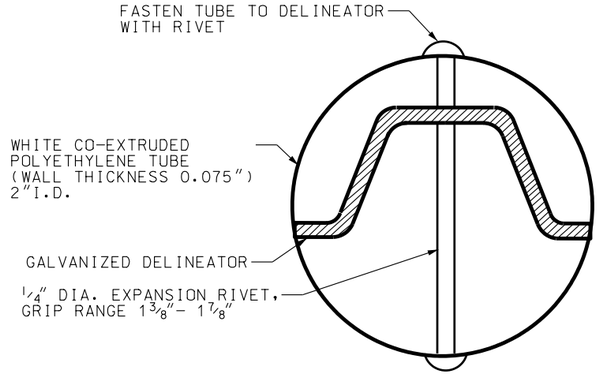
SIGN
R3-4



SECTION A-A



CROSS SECTION
FOR 1.2 LB/FT POST



SECTION B-B
SEE NOTES 2,3

NOTES:

1. USE EXISTING DELINEATOR SPACING WHEN POSSIBLE.
   POST #2 SPACED EVENLY BETWEEN POST #1 & #3
   POST #3 PLACE 10 FEET IN ADVANCE OF POINT OF TANGENCY.
2. USE GALVANIZED STEEL POST WITH 5/16" HOLES ON 1" SPACING, FULL LENGTH OF POST. ATTACH WHITE POLYETHYLENE TUBE WITH REFLECTIVE SHEETING AS SHOWN.
3. USE OTHER APPROPRIATE WHITE FLEXIBLE GUIDE POST UPON APPROVAL FROM ENGINEER FOR MAINTENANCE.
4. INSTALL TYPE II DELINEATOR AS SHOWN.
5. USE A SIGN AT EACH END OF CROSSING ADJACENT TO APPROACHING TRAFFIC WHERE THE MEDIAN IS SEPARATED BY MORE THAN 150 FEET.

REVISIONS

NO.	DATE	APPR.	REMARKS
1	08/14/03	J.L.	CORRECTED TOP DETAIL NAME TO FREEWAY CROSSOWER .

UTAH DEPARTMENT OF TRANSPORTATION
STANDARD DRAWINGS FOR ROAD AND BRIDGE CONSTRUCTION
SALT LAKE CITY, UTAH

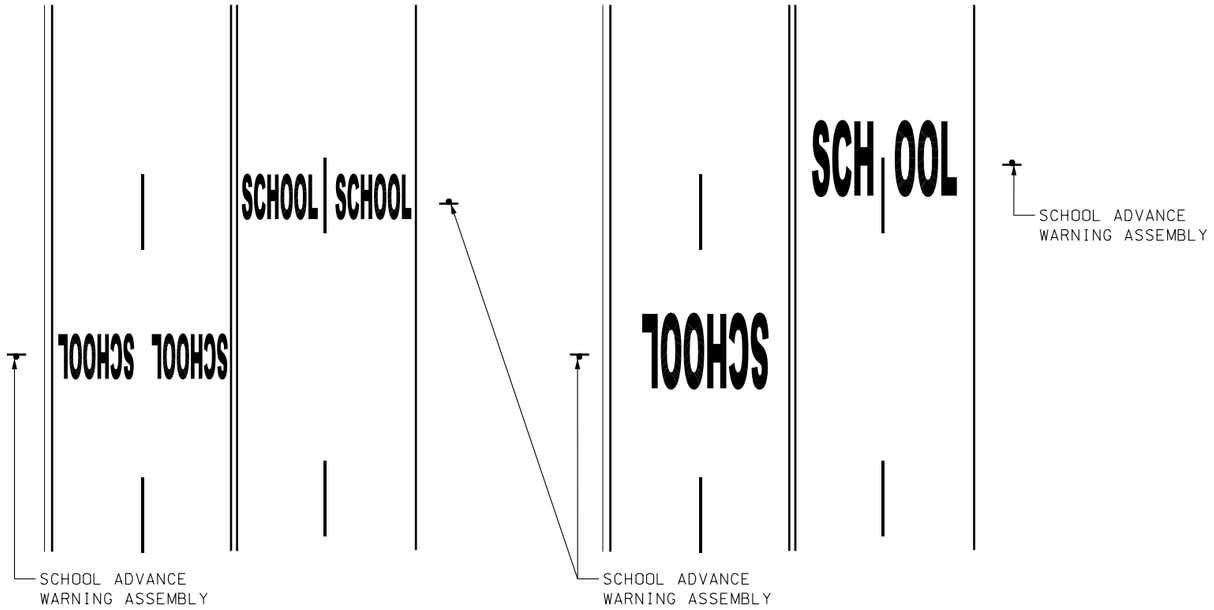
RECOMMENDED FOR APPROVAL — AUG.28,2003 DATE

CHAIRMAN STANDARDS COMMITTEE APPROVED — AUG.28,2003 DATE

DEPUTY DIRECTOR

STANDARD DRAWING TITLE
FREEWAY CROSSOVER MARKINGS

STD DWG
ST 2



STANDARD

ONE MESSAGE PER LANE
ANY NUMBER OF LANES

OPTION

ONE MESSAGE PER TWO LANES
EVEN NUMBER OF LANES ONLY

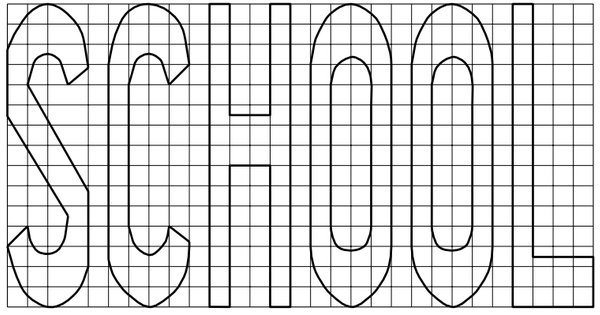
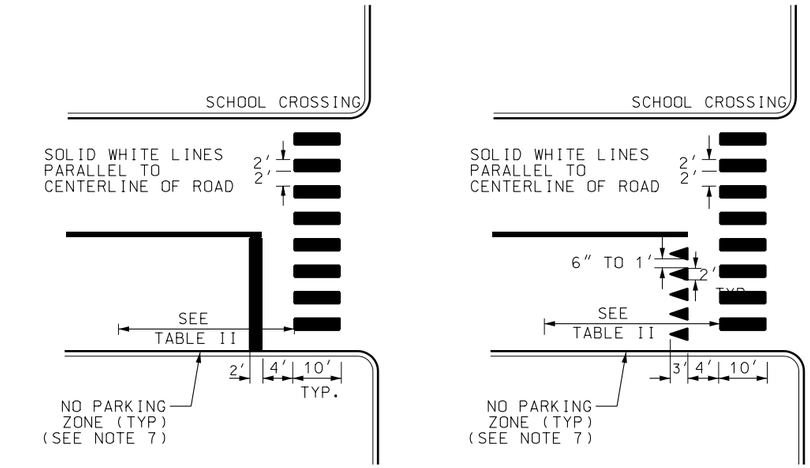


TABLE I			
RECOMMENDED LETTER SIZES			
ONE-LANE MESSAGE			
LANE WIDTH	LETTER WIDTH INCHES	SPACE WIDTH INCHES	MINIMUM LETTER HEIGHT FEET
12′	18	5	6
11′6″	17 1/4	4 1/2	6
11′	16 1/2	4 1/4	6
10′6″	15 3/4	4	6
10′	15	3 3/4	6
TWO-LANE MESSAGE			
ALL	32	8	10



STOP OR SIGNAL CONTROL

YIELD CONTROL

TABLE II	
NO PARKING ZONE	
SPEED MPH	LENGTH FT
25	60
30	85
35	115
40	150
45	190
50	230

NOTES:

1. PLACE ALL SCHOOL MESSAGES, PAVEMENT MARKINGS, AND SIGNING IN CONFORMANCE WITH THE PART 7 SUPPLEMENT TO THE MUTCD, TRAFFIC CONTROLS FOR SCHOOL ZONES, CURRENT EDITION.
2. PLACE SCHOOL MESSAGE OPPOSITE SCHOOL ADVANCE WARNING ASSEMBLY.
3. SINGLE LANE MESSAGES (STANDARD)

   MAXIMUM MESSAGE WIDTH NOT TO EXCEED LANE WIDTH LESS 10 INCHES (FOR EXAMPLE, 12 FEET TRAFFIC LANE WIDTH LESS 10 INCHES EQUALS 11 FEET 2 INCHES MAXIMUM MESSAGE WIDTH).

   MESSAGE TO BE WHOLLY CONTAINED WITHIN TRAFFIC LANE, AND NOT ENCROACH UPON LANE STRIPING OR OTHER PAVEMENT MARKINGS.
4. TWO LANE MESSAGES (OPTIONAL)

   USE TWO-LANE MESSAGE ONLY WHEN THERE ARE AN EVEN NUMBER OF LANES.

   USE TWO-LANE MESSAGE UPON APPROVAL OF THE REGION TRAFFIC ENGINEER.

   ONE-HALF OF MESSAGE TO BE CONTAINED IN EACH TRAFFIC LANE. WHEN A LANE MARKING IS LOCATED WITHIN THE SCHOOL MESSAGE, PLACE SUFFICIENT DISTANCE BETWEEN THE "H" AND THE "O" SO AS TO PROVIDE A MINIMUM OF 5 INCHES FROM THE CENTER OF THE MARKING TO THE EDGE OF EACH LEGEND.
5. USE 24 INCH STOP LINE, AND A 24 INCH x 36 INCH YIELD LINE.
6. ESTABLISH A "NO PARKING" ZONE PRIOR TO SCHOOL CROSSING.
7. RED CURB MARKING IS OPTIONAL FOR "NO PARKING" ZONE.

REVISIONS

NO.	DATE	APPR.	REMARKS
1	08/14/03	J.L.	NEW DRAWING

UTAH DEPARTMENT OF TRANSPORTATION
STANDARD DRAWINGS FOR ROAD AND BRIDGE CONSTRUCTION
SALT LAKE CITY, UTAH

RECOMMENDED FOR APPROVAL — AUG.28,2003 DATE

CHAIRMAN STANDARDS COMMITTEE
APPROVED — AUG.28,2003 DATE

DEPUTY DIRECTOR

SCHOOL CROSSING AND SCHOOL MESSAGE

STANDARD DRAWING TITLE

STD DWG
ST 9